JOURNAL

of the

AMERICAN PODIATRY ASSOCIATION

The Official Publication of the Podiatry-Chiropody Profession

PODOPEDIATRIC ISSUE

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MARCH, 1959

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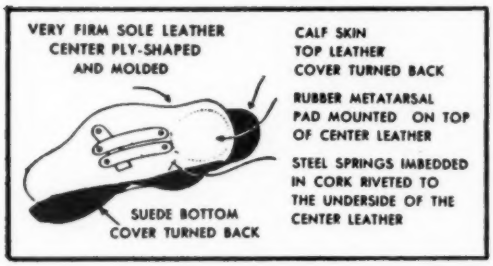
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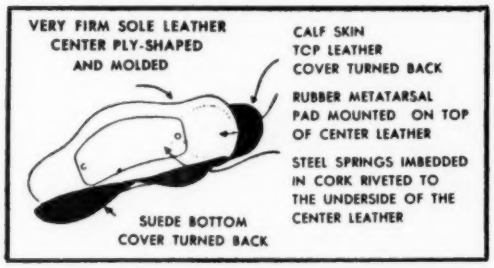
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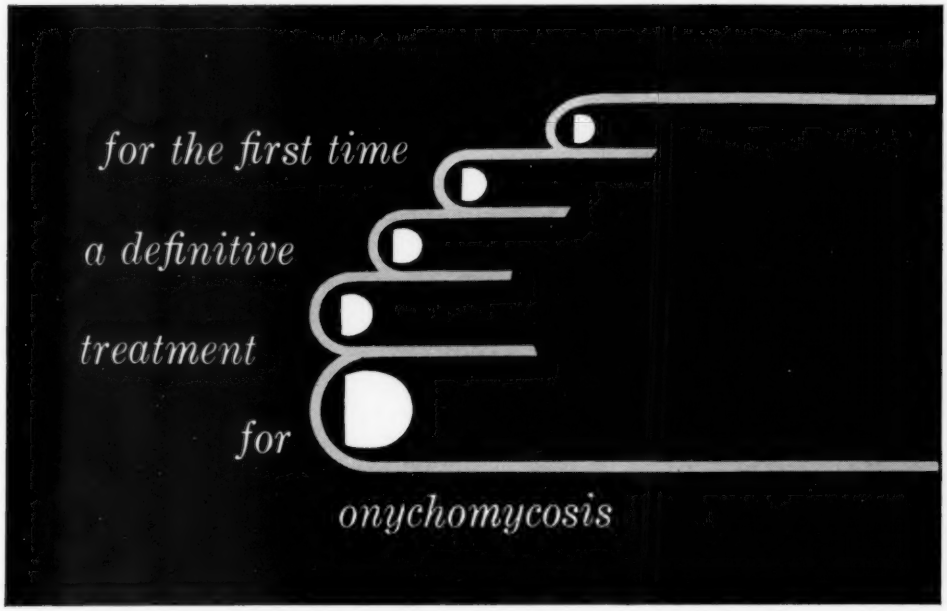

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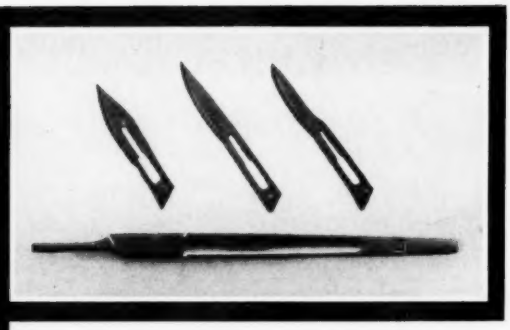

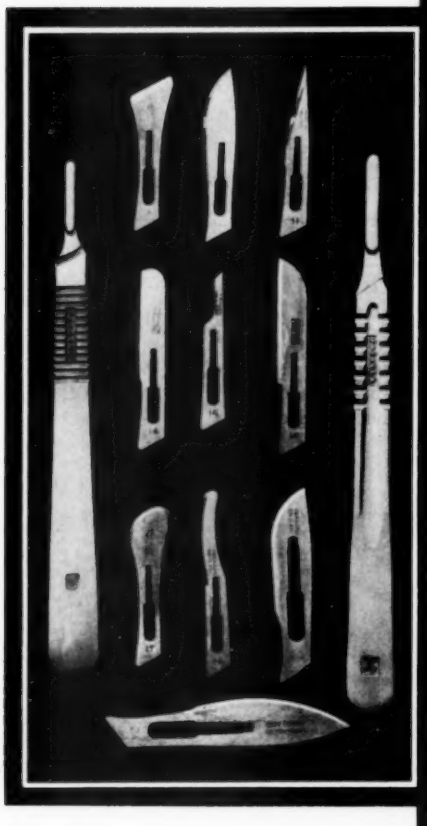

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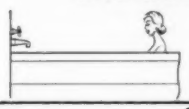

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1. Prentice, H. and Brezak, S.: Jrnl. Amer. Podiatry Assn. 48:191, (May) 1958.
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VOLUME 49 MARCH, 1959 NUMBER 3

THE FUNCTIONAL ADDUCTION OF GAIT IN CHILDHOOD*

MILTON K. KRANTZ, D.S.C.
Milford, Conn.

FUNCTIONAL gait, producing the "pigeon-toed" type of walking, is caused specifically by pathomechanical relationships. These functional disabilities must be distinguished from disease processes and from fixed deformities. Functional disabilities, unlike paralytic and congenital deformities, generally are not permanent disorders. However, some functional difficulties tend to become fixed with age. Tibial torsion, that is, rotation of the tibia on its long axis, is a functional problem in childhood. When abnormal torsion persists beyond childhood, it leads to a fixed deformity. Malfunctioning of hip rotation and pes valgoplanus are examples of functional disorders.

This research has been based on a study of 280 private patients, affording a relationship which permitted a long, intimate investigation of the nature of the problem.

Rotational Motion and the Pathomechanics of Functional Adduction of Gait

The Hip Joint

The hip joint is an amphiarthrosis permitting various combined motions which Steindler[34] describes as a "circumpolar" movement. Pure rotational motion in the living is rare. The discussion here is concerned with internal-external rotation.

The extensors extend the hip joint, and also develop a horizontal component forcing the joint forward. The flexors, conversely, thrust the hip joint backward. Hence, a rotary movement occurs in the horizontal plane about a perpendicular axis, the forward-thrust hip going into outward rotation. The equilibrium between inward-outward rotation is entrusted to the rotators of the hip joint. The outward rotators of the hip joint are the pelvitrochanteric muscles. The inner rotation of the hip is a secondary function involving the tensor fascia, the anterior portions of the Gluteus Medius and Minimus, Adductor Magnus and Pectineus. Normally, the outward rotators are almost three times as strong as the inward rotators.[34] In children who toe-in because of excessive internal hip rotation, this relationship is upset in favor of the inward rotary components. These children tend to twist their thighs inward during rest and while walking.

Accentuated internal hip rotation in rest position can be explained by the difference in the degree of tonic contraction of muscles at rest, as compared with those in gait. In gait the outward rotators counterbalance the pull of the strong inward rotators, whereas at rest there is proportionally less

*Award winning paper in the William J. Stickel Annual Awards for Research in Chiropody-Podiatry, 1958. Presented at the Annual Meeting of the American Podiatry Association, Washington, D. C., August 1958.

resistance by the outward rotators. The limb will follow the direction of the shortened and more powerful muscle contraction. Duchenne[7] points out that outward rotation is important in the hip in both stance and gait. As the pelvis swings forward with the swinging leg, the hip goes into forward rotation while the opposite standing leg rotates inward. With the toes touching the ground, the internal rotators balance the outward rotary component of the abductors.

Since muscle pull about a perpendicular axis must be properly balanced to align the foot normally, an imbalance in such pull is translated into the position of the foot striking the ground. If there is excessive internal rotation at the hip, the internal twist of the standing leg is accentuated in accordance with Duchenne's observation.[7]

The synchronized rotary motions in the lower extremity are emphasized by Jones:[16] "Rotary movement of any one segment in standing or weight bearing position is immediately and equally transmitted to the entire structure." Although the concept of "equal transmission" might be questioned, there is no doubt that rotatory motions are transmitted to other parts of the extremity. When an imbalance originates about the hip, the foot may simulate the motion.

The ligaments also play a role in the rotational motion at the hip. In the ligamentous specimen where the tension of the capsule and of the iliofemoral ligament limits the excursion, the axial rotation range of the femur is 60° to 90°. The greatest axial rotation is obtained when the femur is in 90° flexion.[34] In the living, the musculature exerts further restraint to motion, and the rotary range is 90° when the femur is flexed, but only 30° in normal position. These values are variable in the child, but they may serve as a general guide.

The easiest path for outward rotation is from slight flexion; the easiest for inward rotation is a flexion position of up to 90°.[34] The inversion of secondary functions of the hip musculature is important in changing positions. For instance, the Piriformis, which in normal position is an outward rotator, becomes an inward rotator in strong flexion.[34] Variable rotatory ranges and inversion of secondary function of hip muscles further help to explain the frequent accentuation of internal rotation seen in the seated child. Such factors can be clinically significant in testing for hip motions.

Thus, shortening and greater tonic contraction of inward rotatory components of the hip can produce adduction of gait. Also, there is undoubtedly a ligamentous tightening. The total effect is an exaggeration of internal hip rotation manifested in adducted gait. Such motion can occur independently of other internal twisting conditions arising in the feet or legs. However, excessive internal hip rotation is frequently combined with other pathomechanical phenomena in the lower extremities.

The Knee Joint

The knee joint is a trochoginglymus joint with freedom of flexion-extension and axial rotation. Inward rotation of the leg on the thigh is performed by the Sartorius, Gracilus, Semitendinosus, Semimembranosus and Popliteus. The principal outward rotators are the Tensor Fascia Lata and Biceps Femoris. Outward rotation has a greater range than inward rotation, being greatest (42°) at 90° flexion.[34]

The knee joint is principally involved in rotational pathomechanics as a component in the complex of tibial torsion and/or as a recipient of rotational motions from the hip. In addition to postural motion, it is important to consider the osseous morphology and development of the knee in cases of genu valgum and varum.

Tibial Torsion

Tibial torsion is largely a muscular mechanical effect. "It is the resultant of the muscle tension between the abductors of the foot, the extensors and the opposing inward rotators of the tibia."[34] In the adult there is a normal outward rotation of the lower end of the tibia of 23° to 25°. The upper end of the tibia is rotated 6° outward against the femur when the tibia is extended.

The values for tibial torsion in the child are considerably different from those in the adult. Internal rotation of the lower tibia, rare in the adult, is found in 90% of the newborn. At birth torsion varies between 15° internal and 23° external. The average is 2° outward. During the first year this value increases to an average of 10°. In the second and third years the torsion remains stationary. Then between three and one-half years and four years, the torsion increases to an average of 20°, approaching the adult level.[34]

Children with excessive internal tibial torsion may rotate the feet and legs inward in rest, stance and gait. The muscular pull twisting the tibia produces an apparent inward bowing of the lower leg. Since the talus is locked in the ankle mortis, the talus follows the internal rotation of the tibia. Depending upon other factors in the extremity, foot posture with excessive internal tibial torsion may be either adducted or abducted.

In pes valgoplanus, there is a reciprocal relationship between tibial torsion and the rotation of the foot. Whereas, inward rotation and adduction of the talus rotate the tibia inwardly, deformation of the tibia may also produce pes valgus: Pronation may result also as a compensatory disalignment due to genu varum.[35]

The Foot and Ankle

The ankle joint is a ginglymus, or hinge, joint, and is limited basically to flexion and extension. The talocalcaneal joint permits shifting and gliding, as do the tarsal and tarsometatarsal joints. Motions in the foot generally, except for the ankle and toes, are combined efforts. Supination is accompanied by adduction and pronation by abduction.

Postural Effects of Internal Rotation In Lower Extremity

Functional adduction of gait is generally a product of either excessive internal hip rotation, or excessive internal tibial torsion, or a combination of both these phenomena. Torsion in the lower extremities of small children, Kite[18] states, usually takes one of two patterns: (a) medial torsion with bowlegs and pigeon-toeing, or (b) lateral torsion with knock-knees and flatfoot. Contrary to Kite's findings, the present study showed that knock-knees and pigeon-toeing frequently occurred together, and bowlegs with pigeon-toeing were less often encountered.

Simple excessive internal hip rotation will commonly cause genu valgum with adducted gait. The internal rotatory motion from the hip is transmitted through the knee to the ankle and foot. If the foot is structurally stable, the talus will not slide off its calcaneal support, and the whole foot is carried into adduction during gait (Fig. 1.).

Simple excessive internal tibial torsion may be accompanied by either normal knee alignment or genu valgum or genu varum, depending on the severity of the torsion and the stability of the foot. A foot of sound structure is likely to follow the internal twist of the lower tibia and adduct during gait. In a foot not structurally stable there may be either adduction or abduction. The determining factor is the relative amount of force in the internal twist of the tibia, as compared to the abducting force of the valgus foot. With either adduction or abduction, genu valgum occurs more often than genu varum.

Excessive internal hip rotation com-

bined with internal tibial torsion produces marked genu valgum and gait adduction. The internal rotating movements of both origins are mutually enhanced. Because of the severe internal rotating forces in the limb, the foot usually adducts regardless of stability factors.

Reciprocal relationships between feet and legs have to be considered in posture analysis. If the tibia twists internally it must carry the talus medialward. The converse is also true. The direction in which the foot moves is determined by three factors: (1) The relative imbalance between the abductors of the foot and the internal rotators of the tibia; (2) the resultant effect on the tibia from the everting force at the subtalar articulation, as compared to the resistance of the joint osseous and ligamentous structures, and (3) the relative knee posture, which is partially determined by the rotational motion at the hip joint. Other reciprocal relationships may be involved, such as the forefoot-rearfoot posture.

Essentially, rotational postural effects can be determined only after analyzing the rotational motion in the entire lower extremity, the status of structural stability in the foot, and the reciprocal relationship between foot and leg.

Diagnostic Characteristics of Functional Induction of Gait

Observation of Gait

Five characteristics should be recognized in gait:

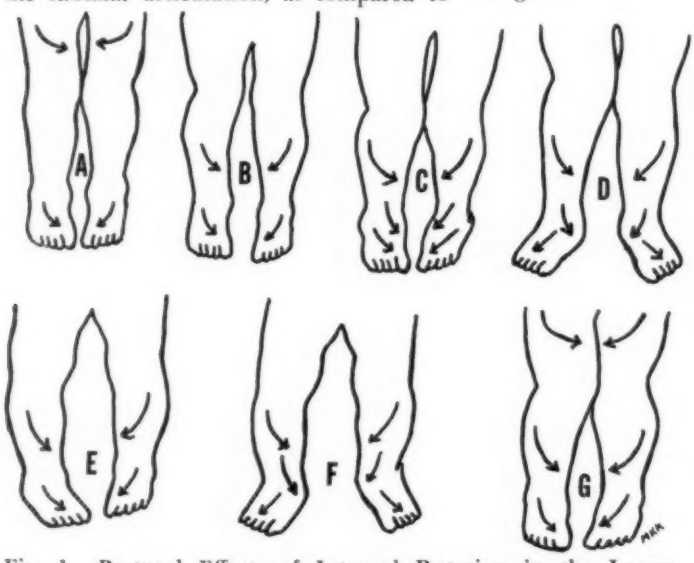

Fig. 1. Postural Effects of Internal Rotation in the Lower Extremity. Arrows indicate the direction of the predominant lines of force in various postural effects. See text for analysis. A—Internal hip rotation causing genu valgum and adducted gait. B—Internal tibial torsion causing adducted gait. C—Internal tibial torsion and pes valgoplanus causing genu valgum and adducted gait. D—Internal tibial torsion and pes valgoplanus causing genu valgum and abducted gait. E—Internal tibial torsion causing genu varum and adducted gait (normal rotation of hips). F—Internal tibial torsion and pes valgoplanus causing genu varum and abducted gait (normal rotation of hips). G—Internal hip rotation and internal tibial torsion causing severe genu valgum and adducted gait.

1. The degree of gait adduction in comparison with normal ranges. Usually, the range limits are approximately 15° to 20° in the early walking months, with the angle gradually decreasing to 0° to 5° at the age of four. Values above this range of adduction persisting after the age of four indicate a need for further study. However, gait adduction is only one factor in diagnosis.

2. Correlation of genu valgum, or varum. In normal development there is a tendency to genu varum in the first year and genu valgum in the second and third years. After the age of four, either of these postures may indicate pathomechanics in the limb.

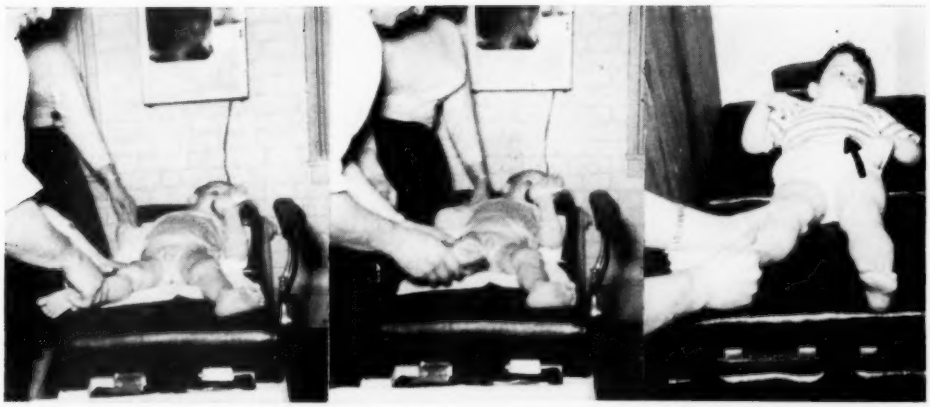

Fig. 2. Testing for Rotational Motion of Hip. Left and Center illustrate method of testing for hip rotation. Note that in this case, external rotation range exceeds that of internal rotation. The patient walks with the limbs externally rotated. Right illustrates raising of opposite hip from the table as one limb reaches limits of external rotation.

3. The specific motions of the thighs and hips. Normally, the thigh as it swings forward rotates slightly outward. When the internal rotators are shortened, the thigh twists inward, causing genu valgum and adducted gait. The standing leg quickly rotates inward, as Duchenne[7] observed. Excessive internal tibial torsion is usually responsible for adducted gait in which the thigh is thrust forward. Genu varum may be noted in this type of gait.

4. The amount of tibial torsion, correlated with factors for given ages.

5. Deviations in foot posture. Heel eversion-inversion, talonavicular attitude, and forefoot-rearfoot relationship correlated with the age of the patient. In the absence of complicating symptoms (abnormal shoe wear, altered knee posture, etc.) the simple pes valgoplanus of young childhood is not necessarily pathognomonic. However, by the age of two and one-half to three and one-half years, the foot should appear comparatively stable.

Observation of Rest Positions

The seated child assumes various foot and leg postures, but often favors the rotations manifested in his gait. Rest posture is best observed when there is a support under the legs. An altered posture leads one to suspect an altered gait and, combined with other diagnostic criteria, it can be of significance.

Testing the Functioning of a Lower Extremity

The test for hip rotation should be done with the patient supine (Fig. 2). With the knee locked in extension with one hand, the limb is rotated internally and externally by grasping and moving the heel with the other hand. Rotation range varies with age, muscle tone, ligamentous tone, and other factors. In young or flexibly jointed children the limb may be rotated 90° or more from the perpendicular into either the internal or external direction. In older or less flexible individuals the range may be markedly reduced. Generally, a three or four year old child should be able to rotate the limb about 60° from the perpendicular. When there is excessive internal hip rotation, the limb may be turned internally to 60° to 90° or more, but less than 60° in the external direction. As resistance is offered to the external twist, the opposite hip raises from the examining table to follow the movement.

Testing of tibial torsion is done in several ways. Medial torsion of the extremities may be congenital or acquired.[18] In congenital medial torsion there is a pronounced lateral convexity of the leg. In supine position, with the legs rolling laterally from the hips, the patellae must point laterally 45° or more for the toes to point straight ahead. The limbs appear bowed. With the malleoli touching, the femoral condyles are two finger-widths apart and the space below the knees about three fingers. Internal-external rotation is normal. In acquired medial torsion, the condition is not as pronounced and can be differentiated by a rotation test. The limb cannot be rotated externally beyond midposition.

Observation at rest, with an estimate of the amount of torsion, has been recommended as the best way to test children.[15] A caliper-pendulum apparatus, described by Nachlas,[23] can be used to measure torsion. Internal tibial torsion can be diagnosed if a line drawn from the anterior superior iliac spine through the patella runs through the lateral border of the foot.[9] Normally this line bisects the second toe. The degree of torsion should be correlated with age and various diagnostic signs. Differences in knee morphology, muscle development and fat distribution should be considered.

Genu valgum and genu varum may be tested by dropping a plumb line through the center of the patella.[41] Normally the line bisects the second toe. In genu valgum the line falls medial to the inner border of the foot. In genu varum it falls to the outer part of the foot. Also, in genu varum there is an excessive distance between the knees when the feet are together, with the heels touching, and the plantar surfaces in full contact with the floor. In genu valgum the inner margins of the feet cannot contact the floor when the flat of the hand is held between the knees.[3] Similarly, in genu valgum the malleoli cannot touch when the child stands with the femoral condyles together. In genu varum the knees cannot touch with the malleoli together.

Medial Heel Wear as a Diagnostic Aid

Wear patterns of shoe heels will be discussed later. Medial heel wear is frequently characteristic of functional adduction of gait. When such gait causes centro-medial or medial heel wear, therapy to control rotational action in the leg is definitely indicated.

Differential Diagnosis

Physiologic adduction of gait can be distinguished from pathomechanical functional adduction of gait on the basis of age, degree of deviation and postural abnormalities previously described. The most important feature of physiologic adduction is normal wear on the shoe.

Adduction deformity is differentiated by motion tests and radiographs. Metatarsus varus is the chief adduction deformity with which functional adduction of gait might be confused.

Vitamin D deficiency diseases may affect the gait. Rickets, now uncommon in the United States, is diagnosed through characteristic laboratory and radiographic findings. Vitamin D resistant rickets presents the picture of rickets even through the patient has had the usual dosage of vitamin D. Severe deformity and dwarfism are often present, with bowing in one extremity and knock-knee in the other. Diagnosis is made through study of the history, physical examination, blood studies, and urinalysis.[36]

Blount's disease (osteochondrosis deformans tibiae) is usually not noted until after weight bearing has begun, and often is not evident for several years after birth of the child. Bowing may be unilateral or bilateral, mild or severe. The disease is generally progressive. Laboratory findings are normal. Diagnosis is by roentgenograms showing a tibia vara with abrupt angulation just below the proximal tibial epi-

physis. The epiphyseal line is sometimes irregular and is associated with a prominent, beaklike, recurving medial metaphysis.[14,36]

Renal rickets due to tubular disease, or the Franconi syndrome, may cause severe disturbances, with deformity in epiphyseal growth. There are disturbances in kidney function and plasma electrolytes. Roentgenograms reveal osteoporosis with rachitic epiphyseal changes.[36]

Chondro-osseous dysplasia and fibrous dysplasia produce deformity when they affect the tibia or femur. There is abnormal epiphyseal growth. Diagnosis is by x-ray studies.[36]

Various paralytic deformities and neuromuscular diseases may cause changes simulating functional adduction of gait.

Other conditions can affect epiphyseal growth and cause a deformity, for example, osteomyelitis, trauma, surgical after-results, and x-ray therapy.

Therefore, the diagnosis of pathomechanical functional adduction of gait is not dependent upon any single factor. All data should be considered in the diagnostic picture. Of particular significance are the various postural deviations noted, their relative degree for a given age, shoe wear, and other differential diagnostic factors.

Statistical Analysis of Gait Adduction

Two hundred and fifty children, with ages ranging from two months to fifteen years, were examined for stance, gait, and postural pathomechanics. Traumatic conditions, neurological disorders, and other diseases were excluded in this study. In this group of cases, adducted gait was noted in 87 children, and abducted gait in 100 children, an incidence which was quite comparable. In the remaining 63 children either the gait was normal or there were orthopedic conditions, such as pes cavus, pes equinus, etc., which did not adduct or abduct beyond normal limits. Of the 87 cases of adducted gait, 68 were functional and 19 of adductional deformity type (internal tibial torsion, internal hip rotation, or these two deformities combined). A comparison of knee posture in adducted and abducted gait showed that of 87 with adducted gait, 52 (59.8 per cent) had genu valgum and 7 (8 per cent) had genu varum. A somewhat similar incidence was found in the 100 cases of abducted gait; 42 (42 per cent) of these patients had genu valgum and 6 (6 per cent) had genu varum. These findings coincided with those of other writers.[2,11,12,39]

The largest number of adduction problems were found among the two year olds. Fifty-two of the total 87 adduction patients were in the age group ranging from birth through three years. A significant number (40.2 per cent) of the 87 patients were four years old or more. The percentage of female patients (52.2 per cent) was only slightly higher than that of the male patients (44.8 per cent).

Among the 67 children with adducted gait, 26 (29.9 per cent) had normal foot posture; 19 (21.8 per cent) had adduction deformity; in 42 children (48.3 per cent) valgus foot posture accompanied adducted gait. Valgus foot posture denotes heel eversion and/or talonavicular ptosis, as seen in pes valgus and pes valgoplanus.

Medial heel wear was seen in 34 (81 per cent) of 42 cases of adducted gait with valgus foot posture (Table I), and central or lateral heel wear in 8 (19 per cent) cases. It must be concluded that if such a syndrome produces sufficient stress to create abnormal heel wear, it must be regarded as decompensative in nature. It can also be concluded that because of the large numbers of various adducting gait cases with medial heel wear, such wear is more indicative of adducting than of abducting gait.

Analysis of Heel Wear Patterns of Shoes

In normal gait, the leg is thrust forward to prevent the body weight from following gravitational pull. As the heel strikes the

Table 1. Comparative Heel Wear Patterns

Cases of adducted gait with either normal foot posture or adduction deformity	Medial Heel Wear	Central or Lateral Heel Wear
45	21 (46.7%)	24 (53.3%)
Cases of adducted gait with valgus foot posture		
42	34 (81%)	8 (19%)
Cases of abducted gait		
100	21 (21%)	79 (79%)

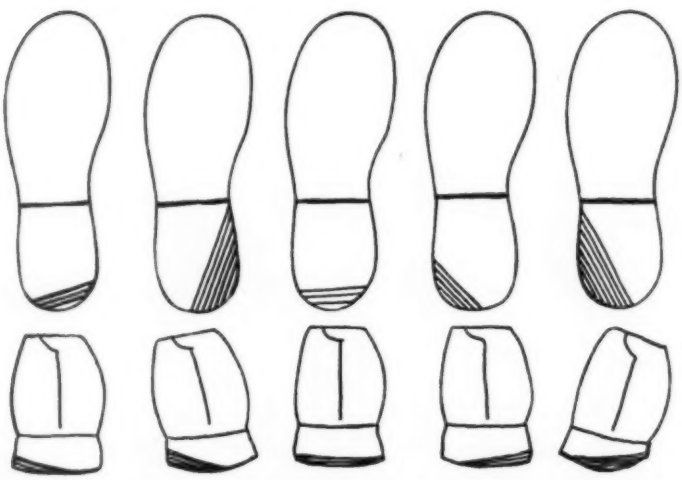

Fig. 3. Heel Wear Pattern of Shoes. The shaded area indicates the site of wear in typical wear patterns of shoes. The right shoe is used to illustrate in both the bottom and posterior views of the shoe. (A) Posterior-medial wear. (B) Medial shearing. (C) Posterio-central wear. (D) Posterior-lateral wear. (E) Lateral shearing.

ground, the weight is transmitted from the heel through the foot toward the toes.

The wear on the heel of the shoe is primarily the result of the initial striking on the walking surface. The manner in which the heel strikes determines the site and type of wear. The method by which weight is transmitted through the foot has little to do with posterior heel wear. But it does affect wear of the anterior of the heel, counter, shank and sole. Determination of the manner in which the heel strikes requires correlation of leg rotation with foot posture. The leg rotational effects are governed mainly by the musculature controlling the swing phase of gait. Foot posture is determined by both structural and postural characteristics in the foot and leg.

Various patterns of heel wear are fairly characteristic of certain gaits. (Fig. 3.)

1. Posterior-medial heel wear is seen most often in adducted gait caused by short internal hip rotators and/or excessive internal tibial torsion. Genu valgum may be present. The foot may be structurally sound. The leg is rotated internally and the heel strikes at the posterior-medial aspect.

2. Medial shearing of the heel is usually seen with adducted gait, genu valgum and heel eversion. (Occasionally, it is seen with

abducted gait where there is severe heel eversion.) The heel strikes medially and the weight is transmitted along the medial portion of the foot. The leg is in internal rotation.

3. Posterior-central heel wear is seen with normal gait, mildly adducted gait, or mildly abducted gait. The leg is in relatively neutral or slight internal rotation. The heel strikes centrally. Structural factors in the foot determine the final characteristics of gait.

4. Posterior-lateral heel wear is usually seen with normal or moderately abducted gait. The leg is in slight external rotation and the heel strikes posterior-lateral. Occasionally, an adduction deformity produces such wear, if the leg happens to be externally rotated. The latter occurs sometimes with genu varum. When the gait is abducted, structural factors in the foot may govern shoe wear.

5. Lateral shearing of the heel is most often seen with widely abducted gaits. But occasionally it is seen with adduction deformity accompanied by marked supinatory motion. In abducted gait, there is generally excessive external rotation at the hip. The foot may be structurally stable or instable.

Thus, the amount of abnormal heel wear is often directly proportionate to the amount of decompensative force applied to the foot. Although medial heel wear can be seen with good foot structure, it is more frequent and severe with structural instability. This is particularly true when functional adduction of gait is present.

Analysis of the Concept of Adducted Gait As a Compensatory Reaction to Pronation

The concept of adducted gait as a compensatory reaction for the strain of pronation has been cited by many authors. Whereas a few writers[1,38] have questioned the concept, Nachlas[22] described adducted gait as a protection against strain arising from abduction deformity, and referred to the syndrome as "paradoxic clubfoot." However, in an earlier article,[23] he warned that the strain-relieving explanation was not adequate for all cases of static flatfoot which adducted in gait.

Search of the literature afforded no definitive explanation for the general statement that "some children toe-in to relieve the strain of pronation." It might be postulated that the supinating muscles counteract the pronators in order to help support the arch and swing the foot into adduction in gait. However, this supposition is questionable. The character of gait adduction immediately leads one to suspect that its nature may not be compensative for strain. Since one of the cardinal symptoms is accentuation of adduction with fatigue, a child would hardly be able to sustain a compensatory muscle reaction when he is fatigued. Morton[21] states that robust individuals are able to compensate for disalignment of the foot by adducting in gait, a distinction not evident in the present study.

Children with pes valgoplanus show strain symptoms such as crying at night because of cramps in the leg muscles and a reluctance to walk long distances. Occurrence of these symptoms is small in comparison with the number of cases of pes valgoplanus. They are noted in cases of both abduction and adduction. Therefore, it is difficult to relate symptoms with the ability to achieve compensations. Compensative muscle reaction may be attempted in pes valgoplanus, but it cannot be sustained. The pain probably arises from the resultant muscle fatigue, as well as from ligamentous strain. If compensation were sustained sufficiently to cause persistent gait adduction, why does the child toe in more when he is tired?

A further objection to the theory of compensative adduction is based on the fact that when muscles compensate for a deficiency, they usually hypertrophy. The author has not detected hypertrophy in the

supinating musculature of children with pes valgoplanus who adduct in gait. With the exception of short posterior leg muscles, Rubin[25] has said that to permit weak foot change, muscle imbalance must exist almost to the state of paralysis. If the converse were true, the supinators, to sustain compensation for pes valgoplanus, should almost paralyze the antagonistic pronators. This is not the clinical finding.

In normal function, the supinating-pronating musculature is not likely to permit considerable imbalance. Steindler[34] states, "In the subastragular joint the supinators have more than twice the strength of the pronators, but, here again, gravity acts as a pronatory force. In the midtarsal joint the pronators and supinators are more evenly matched. Morton[21] regards the relative strengths of the pronators and supinators as being of 'fractional variation.' Schwartz and Heath[30] note that clinical evidence indicates that strong extrinsic muscles do not assure protection against pronation. Although Russell Jones[17] states that muscle training can change the habitual attitude of the foot in weight bearing, he emphasizes the inability of the extrinsic muscle to raise the arch. The musculature is regarded as primarily concerned with inversion and eversion of the foot to preserve the relative constancy of the ratio of weight bearing among the metatarsal bones. One would deduce, then, that compensatory adduction for the flattened foot could not be easily achieved.

The assumption that the foot can be habitually rotated internally to compensate for static pes valgoplanus is difficult to correlate with clinical observations. The gait of the child with pes valgoplanus and adduction is frequently marked by pes valgus and medial heel wear. The gait is often clumsy and not conducive to proper functioning. These characteristics must be regarded as decompensative rather than compensation features. Efforts made to help invert the foot may result in exaggeration of in-toeing and clumsiness, as the author observed in 14 cases where a pronating-adducting gait was treated with conventional measures to invert the foot. Many of these patients were older children, treated for long periods of time. When the adduction of gait was corrected, the treatment of the pes valgoplanus was greatly enhanced.

Treatment of functional disturbances should be designed to promote proper functioning. If the therapy employed disturbs the gait, the therapy cannot be deemed proper for the condition. Therefore, since function is hindered by inversion therapy, such therapy is in conflict with the compensating theory. The conflict lies in the fact that imversion should help the gait, because it is helping the so-called compensatory effort.

It becomes obvious that a pronating-adducting gait cannot be considered simply a compensatory situation. Although compensation may be attempted, obviously it is generally not sustained, and, therefore, the compensation theory is not adequate to explain the usual case of pes valgoplanus with adduction in gait. Furthermore, since available facts do not support such a notion, it would be more rational to think in terms of a postural-structural deficiency complex to interpret the gait type in question.

Postural-Structural Deficiency Complex of Pronating-Adducting Gait

The etiologic factors in longitudinal arch depression have been classified by Rubin[25] as anatomic and physiologic deficiencies, environmental, traumatic, systemic disturbances, and nonadaptability. Anatomic and physiologic deficiency can be both structural and postural. Intrinsic structural deficiencies are evident in the short first metatarsal, the gorilloid navicular, and the long necked talus. Extrinsic structural deficiencies are noted in a short limb, genu varum, or valgum, etc. Postural deficiencies are recognized in short posterior leg

muscles, and in short internal or short external rotators of the hip joint. Postural changes cause abnormal stress which may result in structural changes. External rotation may produce pronation and weak foot. Knock-knees may cause pigeon-toes with eversion, and tend to break the foot down.

The primary postural deficiencies causing internal rotation of the leg are internal tibial torsion and internal hip rotation. Internal rotation of the leg, caused by postural change, when combined with structural deficiency in the foot, may produce a pronating-adducting gait. Because of the reciprocal relationships between the foot and leg, the effects of these changes may be mutually enhanced to produce a decompensative syndrome.

This interpretation of pronating- adducting gait as a complex may be applied in considering therapeutic measures, as demonstrated in the following case.

A boy aged 3 years and 9 months was referred by a pediatrician for treatment of flatfoot. His feet were flaccid, markedly flattened with talonavicular bulging and heel eversion. Gait was adducted on the left, but was straight on the right. Genu valgum and pronation of foot were more marked on the left side than on the right. The left foot hung inward with mild internal tibial torsion at rest. External rotation of the left hip was mildly restricted. The shoes were worn centrally on heels and soles; the counters buckled medially.

Mild inflare shoes with slight medial heel wedges were prescribed, corrected with elastic Robert's shape braces. The arches were padded with firm felt. The response to this therapy was an exaggerated adduction on the left side, which made gait more clumsy than before. Although the genu valgum improved slightly and the shoe counters retained their shape, the heels, particularly the left, wore medially during three months of wearing. The treatment was deemed unsatisfactory.

A Dennis-Brown night splint was applied and gradually adjusted to hold the feet externally rotated, 15° on the right and 45° on the left. Use of new shoes, corrected as previously, was started at this time. After 13 weeks, the left heel was worn centro-laterally and the right centrally. Gait was improved remarkably, abducting within normal range both with and without shoes. The genu valgum was better controlled. Both feet were upright at rest.

This case illustrates the need for treating some cases as a foot-and-leg complex. In similiar cases, foot correction has been complemented by derotation therapy applied to the legs. In others, valgus foot disorders have been helped by simply controlling external or internal rotation with Dennis-Brown bars at night. In these cases, without use of shoe corrections, stabilization of the talocalcaneal articulation was achieved by simply permitting the foot to strike the ground in proper rotational alignment.

It is suggested that all foci of pathomechanics in functional foot disorders be treated to restore normal function. When stance, gait and shoe wear are in normal range, proper treatment is easily defined.

Summary

A study of functional adduction of gait in a series of 250 children, together with a discussion of functional adduction of gait, statistical characteristics of adduction and, finally, an analysis of heel wear patterns, led to the following conclusions.

Rotational motions of the leg, particularly of the hip and tibia, are translated into gait characteristics assumed by the feet. Functional adduction of gait is due chiefly to excessive internal hip rotation and/or excessive internal tibial torsion.

The functional effects of pathomechanics in the extremities are determined by the interdependence of factors in both postural

and structural stability. Reciprocal relationships may exist between these factors. Postural effects in functional adduction of gait vary with the presence and relative degree of internal hip rotation, internal tibial torsion, and structural weaknesses of the foot. Diagnosis is made by use of tests, by observing gait and rest postures and abnormal shoe wear and by differentiation from other conditions causing adduction, particularly physiologic adduction and adduction deformity.

Genu valgum is a frequent postural effect in functional adduction of gait, particularly in cases complicated by foot pronation. Gait adduction, genu valgum and valgus foot postures frequently combine in a decompensative syndrome to produce medial heel wear. Medial heel wear occurs in a significant percentage of cases of gait adduction in which the feet are normal or are altered by adduction deformity. Heel wear is determined primarily by the manner in which the heel strikes the ground. Internal rotation of the leg is more likely to cause medial heel wear than is external rotation. The method of weight transfer through the foot determines other shoe wear traits.

The validity of the concept of adducted gait as a compensatory reaction to pronation is questionable. Interpreting pronating-adducting gait as a complex of postural-structural deficiency seems consistent with available facts.

Finally, treatment in functional foot disorders should be designed to restore normal function. Treatment is well defined only when this end is achieved.

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IN-TOEING AND OUT-TOEING IN INFANTS AND CHILDREN

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THE foot problems of the infant and young child have not received the attention of either the chiropodist-podiatrist or the pediatrician in proportion to their importance to the total well-being of the patient. Many professional men meeting these problems consider them of little significance, and think that the wearing of proper shoes will effect a correction. Many shoes are padded, wedged, and otherwise "corrected," with the vague hope of obtaining some results, or at least of allaying the fears of the parents that something may be seriously wrong.

While the problems associated with in-toeing and out-toeing are not confined to children, we tend to consider them as such. A clear understanding of the subject as it applies to children, however, can prove invaluable also in the care of adults in whom these conditions exist.

Relationship of the Lower Extremity To the Hip Joint

The author firmly believes that all locomotion is initiated from the hip joint, and that the position which the foot takes in relation to the walking surface depends largely upon the primary relationship of the extremity to the hip joint. Thus, if the limb is maintained in a position of outward rotation, the foot will usually be rotated outwardly. Conversely, if the limb is maintained in a position of inward rotation, the foot will be rotated inwardly. This tendency toward inward-outward rotation, or what may be considered the normal range, is present at birth and, if nothing interferes with this position, it is maintained more or less as the child grows older.

Structure of the Hip Joint

It seems inconceivable that placement of the foot in abduction or adduction can be overcome without first considering the basic structure of the hip joint and its disorders which affect in-toeing and out-toeing gaits.

The normal range of motion of the limb at the hip joint in total inward and outward rotation is approximately 180° — a range of 90° in the inward rotation and 90° in outward rotation. Since variations can occur within normal limits, a 10° variation either way can be considered within normal range. Thus, if the range of inward rotation of a limb is 100° and that of the outward rotation is 80° we can consider such rotation to be within normal limits, but if the inward and outward rotations are 130° and 50° respectively, we can consider this an abnormal rotation and not conducive to normal functioning. These variations are found not only in children, but also in adults of all ages, and the degree of variations range through almost the entire scale of the protractor.

In analyzing the anatomical factors influencing the functioning of the hip joint, let us briefly review the development of the acetabulum, the head of the femur, the structures surrounding the femur, and the ligaments and muscles that maintain the rotational position of the femur, which in turn controls the position of the limb itself.

The acetabulum is ossified from three primary centers which converge at the age of 13 or 14, but do not unite until the twentieth or twenty-fourth year. The acetabulum may be narrow, wide, elliptical, large or small. It may vary in depth; it may be so shallow that the head is barely supported, or so deep that motion is limited. The acetabular floor may protrude into the pelvic cavity. If the superior portion of the rim is not well developed, or if it is flattened, dislocation of the head may result. A displaced femoral head may create a false acetabulum on the outside of the ilium. In cases of dislocation facets may develop on the posterior acetabular rim from pressure and friction against the lesser trochanter.

The femur ossifies at the proximal end

from three centers. The head of the femur begins to ossify during the second half of the first year after birth, and becomes completely joined to the neck during the nineteenth year. The lesser and greater trochanters appear about the fourth year. The former unites with the shaft at about the seventeenth year and the latter at the eighteenth year. Both trochanters are considered part of the joint area because they are contained within the capsule of the hip joint. In congenital dislocation of the hip the lesser trochanter may be absent or flattened out.

The femoral head is usually rounded to conform to the acetabulum. If the acetabulum is deep, the head may become elongated and pointed and the fovea may be absent. In congenital dislocation the femoral head may be completely eroded or mushroom shaped. It may be grooved because of pressure by a fold in the articular cartilage.

A decrease in the angle of inclination between the head and neck of the femur and the shaft of the femur (coxa vara) may be due to trauma, to a slipped epiphysis, or to disease. An increase in the angle (coxa valga) may be due to disuse paralysis of the lower extremity with little or no weight bearing. This angle of inclination is considerably greater in children than in adults, and decreases with age as weight bearing increases.

The ligaments of the hip joint, which play an important role, are the pubofemoral capsular, the ischiofemoral capsular, and the iliofemoral or 'Y' ligament of Bigelow. Within the acetabulum itself are ligaments of some importance, the teres, the transverse, and the labrum glenoidale or cotyloid ligaments.

The pubofemoral capsular ligament, running from the ramus of the pubis to the pubic portion of the acetabular margin, limits outward rotation of the femur. The ischiofemoral capsular ligament runs from the ramus of the ischium to the ischial portion of the acetabular margin and lies at the posterior aspect of the joint. From this position it limits inward rotation of the femur. The ileofemoral ligament forms an inverted Y and attaches above to the anterior inferior iliac spine and to the acetabular margin one inch behind it. It is coextensive with the Rectus Femoris and the Vastus Medialis muscles, and creates the trochanteric line. The upper limb of the iliofemoral ligament aids in the limitation of lateral rotation.

The ligamentum teres is a strong, somewhat flattened band of fibrous tissue, attached by one end to the superior half of the depression on the head of the femur and by its medial end to the lower edge of the articular surface of the transverse ligament. This ligament varies greatly in its strength and development in different subjects. In certain cases it is absent. The ligamentum teres usually becomes tense when the femur is rotated laterally, thereby aiding in restriction of the lateral rotation. The transverse ligament bridges the acetabular notch and has strong transverse fibers attached to both of its margins, but more extensively to the postero-inferior margin. The labrum glenoidal or cotyloid ligament consists of a strong ring of fibrocartilaginous tissue attached to the entire rim of the acetabulum. This ligament grasps the head of the femur which it encircles and is firmly implanted on the rim of the acetabulum and the transverse ligament.

An articular capsule envelops the joint cavity. Its fibrous stratum is of great strength, but it is not of equal thickness throughout, being thickest on the anterosuperior aspect.

The primary inward rotators of the femur on weight bearing are the Iliopsoas, the Pectineus, and the Adductor Longus. The primary outward rotators of the femur are the Gluteus Maximus and the short muscles of the thigh which include the Piriformis, Obturator Internus, Gemelli, Obturator Externus and the Quadratus Fem-

oris. The outward rotators are far more powerful than the inward rotators, but their interaction is balanced to some degree by the ligaments which limit outward rotation.

The hip joint, therefore, is constructed not so much to allow a great freedom of movement, such as that of the shoulder joint, but for stability, which is essential in the maintenance of the erect attitude. The range of motion of the hip joint is well checked by balances and counterbalances. This balancing phase of the hip joint is a primary cause for concern, because whenever it is disturbed by individual variations at birth a balance disorder is produced in the feet. Fortunately, an abnormality existing in the range of motion at the hip joint can be measured and overcome with treatment that is now relatively simple and within the scope of our chiropodic practice.

In-Toeing Problems

The basic disorders producing in-toeing in children are: (1) talipes equinovarus, (2) metatarsus adductus, (3) limitation of outward rotation in the hip joint, and (4) compensatory forefoot adduction associated with a rearfoot weakness.

Talipes equinovarus, congenital or acquired, causes a child to walk with an in-toeing gait, until it is corrected, because of mechanical difficulties associated with the deformity. Actually, three deformities are present. The equinus deformity produces a toe gait. The talipes deformity which arises from the severe inversion of the foot causes the patient to appear to be walking on the lateral aspect of the ankle. The varus deformity is actually an adduction involvement, resulting from a shortening of the tibial muscles and a weakening of the peroneal group of muscles.

Talipes equinovarus is easily diagnosed if the patient has an in-toeing gait together with x-ray evidence of a malpositioning of the bony structures of the foot. The relative position of the talus and calcaneus is seen particularly in the medial lateral views. In the normal foot both bones have typical contours, with the calcaneus shaped like a Dutch wooden shoe. When the deformity is present in early childhood the calcaneous has the appearance of a rectangular block. In the normal foot of a child the talus at its anterior inferior margin dips downward and covers the tip of the anterior superior margin of the calcaneus. In the deformed foot the talus is seen on a plane above and horizontal of the calcaneus.

Metatarsus adductus is a deformity often called one-third of a clubfoot. The diagnosis can be established as follows:

(1) In the foot of the unaffected child you can place your thumb at the base of the fifth metatarsal and abduct the forefoot from 5 to 10 degrees. The lateral margin of the normal foot will be straight or slightly concave. The foot with a varus deformity will be convex because of a primary locking or crowding at the midtarsus and metatarsal bases. (2) Medial lateral x-ray views will show a normal talus and calcaneus with a fairly normal positioning of the two bones in their relative position to each other. The dorso-plantar projection, however, will demonstrate the typical crowding at the bases of the metatarsals, together with the varus positioning of the metatarsals.

Limitation of outward rotation in the hip joint, the third factor in producing in-toeing, like the two conditions described, can be unilateral or bilateral. It can be associated with talipes equinovarus or metatarsus adduction, or it can be an entity by itself. The child walks with an in-toeing gait, but none of the diagnostic factors previously described are evident. X-ray findings are normal. The leg can be put through a range of motion at the hip joint of 180°–90° of inward rotation and 90° of outward rotation. A limitation of motion or an increase of motion within 20° of that range is not considered abnormal, but if beyond 20° some corrective measures must be considered, if it inter-

feres with normal gait.

Thus, a child with a range of 60° of outward rotation and 120° of inward rotation will walk with an in-toeing gait, because placement of the foot depends primarily upon the pendulum-like swing of the entire limb. In the author's opinion the primary disorder lies in the ligaments of the hip joints and, more specifically, in the pubocapsular ligament and the ischiocapsular ligament. A shortened pubocapsular ligament at birth will preclude an in-toeing gait because motion in the range of outward rotation will be limited. The reverse is true with reference to the relationship between the ischiocapsular ligament and out-toeing gait. Special shoes, built-up shoes and foot appliances, as such, are of little or no value in correcting this condition.

Compensatory forefoot adduction associated with a rearfoot weakness which produces in-toeing is most important, but is the least understood. An understanding of this condition will clear away much of the confusion regarding the basic in-toeing problems. These children present a marked Helbing's sign associated with rearfoot weakness, and a forefoot that adducts during walking. There is no crowding at the metatarsal bases; x-ray findings are either fairly normal, or they may demonstrate some retardation in bony development. These children, in contrast to other children with rearfoot disorders who abduct the forefoot, have excellent anterior and posterior tibial muscular action, but toe-in reflexly or instinctively to overcome their rearfoot weakness.

Weight bearing with the rearfoot in valgus may provide a pain reflex that activates the Tibials similarly to that obtained when digital pressure is applied at the talonavicular articulation. The foreshortening of the longitudinal arch brings about the same foot attitude that we strive for when we strap the foot, or pad the shoe, or use a Whitman plate to correct a 'weak foot.'

Obviously, these children require aid in their valiant efforts to accommodate for this condition. We must try to help them with an in-toeing gait until the structures become strong enough to carry the body weight without undue strain on the rearfoot. This may take a period of years to effect. The parents, therefore, must be instructed as to the apparently contradictory gait problems involved.

Out-Toeing Problems

Out-toeing in a child is also a product of four basic disorders: (1) talipes equinovalgus, (2) talipes calcaneovalgus, (3) limitation of inward rotation in the hip joint, and (4) calcaneovalgus.

Talipes equinovalgus gait, congenital or acquired, is always an out-toeing gait. This deformity is the opposite of talipes equinovarus. The peroneal muscles are shortened and the tibial muscles are weak and inadequate, so that the foot is pulled into a valgus and abducted position, and the child walks on his toes. Roentgenograms reveal structural changes in the tarsal bones and a malpositioning of the bones of the foot. The primary variation revealed by the roentgenograms will be the talocalcaneus relationship. The talus will appear to be in an almost vertical line to the calcaneus, almost anterior, and at right angles to it.

Talipes calcaneovalgus produces out-toeing similar to that of talipes equinovalgus, except that the child walks with the toes high off the floor, with only the heel touching it. In this condition the extensors are shortened and the flexors are weak and inadequate. Both talipes equinovalgus and talipes calcaneovalgus seem recently to be occurring less frequently.

Limitation of inward rotation in the hip joint, the third factor to be considered, occurs frequently and can produce serious foot problems if uncorrected. These problems usually are associated with structural deficiencies which develop during the early formative stages, through improper weight bearing. This disorder can be associated

also with talipes equinovalgus or talipes calcaneovalgus. In any event, it must be recognized as a separate entity and treated accordingly.

Seemingly, a congenital shortening of the ischiocapsular ligament is the original and primary etiologic factor. This shortening does not allow a full rotation of the limb. Many patients less than one year old are seen who have 180° of outward rotation and no inward rotation whatsoever. When these children begin to stand and walk, they hold their feet and legs at a 90° position in the plane of forward progression. While most of the cases in this category are bilateral, unilateral disturbances are seen occasionally. Many of the problems dealing with limitation of rotation at the hip are seen associated with brain injuries, such as cerebral palsy.

Calcaneovalgus, the fourth entity, is the most common of all factors producing an out-toeing gait in children, and probably has brought more confusion to the doctors dealing with foot problems than any of the others. For many years the term 'flat foot,' 'fallen arches,' 'weak foot,' and 'pronated foot' were used synonymously, indicating some functional and structural weakness that made the patient assume an abducted stance. The Army records of World Wars I and II show that about 15 per cent of all men examined for military service had third or fourth degree flat foot.

A survey of nearly 500 newborn infants, made in 1948 by Orr and his orthopedic associates, showed that 15 per cent had a 'calcaneovalgus,' a term akin to those used above. Orr maintained that these were children who grew up with foot problems regardless of what was done for them during their formative years. He believed that for best results, treatment has to be instituted very early—preferably while the child is still in the crib.

An important diagnostic sign in calcaneovalgus is the extreme ease with which the foot can be dorsiflexed on the leg and the restriction of plantar flexion at the ankle. Whenever such signs can be demonstrated, the diagnosis of calcaneovalgus should be positive, and adequate treatment must be instituted.

Treatment of In-Toeing and Out-Toeing Disorders

In many of these cases, an ambulatory device developed by the author in 1944, which is attached to surgical shoes, has been successfully used for the correction of the talipes disorder. This device, called 'Skates' by children, allows a child to obtain correction under conditions that are physiologically correct. Overcorrection is achieved at a minimum cost to structure and function, and once correction is obtained, it is maintained very simply until puberty, when the corrected structures become more permanent.

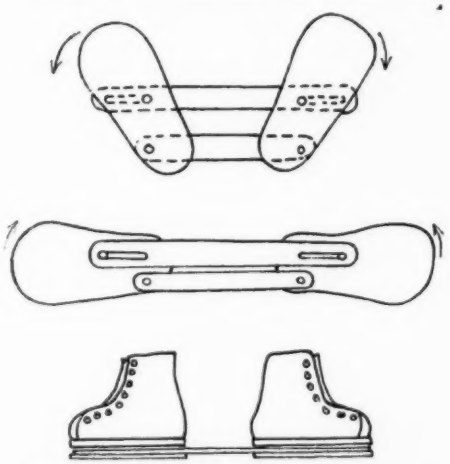

Fig. 1—Skate designed for in-toeing problems. **Upper**—Plantar View. Feet will move in direction of arrows and forward and backward. Size of step limited by length of bar. Range limited by fixed stops. **Middle**—illustrates full range of overcorrection. **Lower**—Shows device attached to shoes sandwiched between two metal templates covered with a plastic sole.

Description of Skates: Originally such devices were called Brachman Talipes Splints, or Reciprocal Ambulatory Skid Plates. They are now commonly referred to as "Skates." They consist of two sliding metal bars which are sandwiched between two aluminum plates attached firmly to

each shoe. The device allows the patient to use his feet only in a predetermined range of motion, usually an overcorrected range, as prescribed by the doctor. (See Figs. 1 and 2.)

The Skates are most efficient when attached to a surgical type of shoe, because such shoes are constructed to stand the wear and tear they receive. These shoes have open lacing to the end of the toes, making it easy to insert a contorted foot into the shoe. Five basic types of Skates have been designed to care for five specific foot and leg patterns in unilateral and bilateral cases. Many individual factors must be considered in preparing each prescription, so that it is necessary to construct each pair on an individual basis. Each pair of Skates is made and attached to the shoes by hand as ordered by the doctor, and are so designed that they can be changed only when they are returned to the laboratory under order of the doctor. When the Skates were first designed, some of the parents of the patients would reset the angle of correction at their own discretion, and I was compelled to 'freeze' the amount of correction.

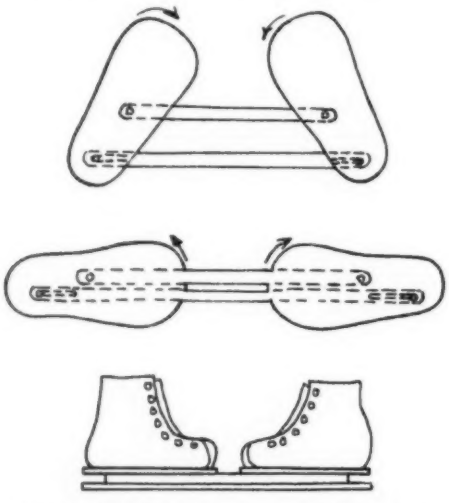

Fig. 2—Basic design to correct out-toeing. Legend in Fig. 1 applies.

The doctor instructs the parents in the best technic designed to teach the child how to move about with the Skates. The extent of activity of the patient is prescribed by the doctor. Obviously, the activity must be limited to a few minutes in each hour if the structures are very weak and unaccustomed to bearing weight. This time element can be increased gradually from week to week.

The Skates allow the patient to perform most of the movements associated with locomotion. The device may be said to carry out the following physiologic principles:

1. In normal walking, one foot is used at a time and the young child obtains no more than 8 to 10 square inches of support from each foot. When using the Skates both feet are always in contact with the floor and this base area of support includes a parallelogram of not less than 100 square inches. This factor alone induces the patient to balance himself, once he finds it easy to do so and loses his fear of falling.

2. All undesirable movements are restricted, and new, more desirable habit patterns affecting the neuromuscular pathways are developed. In this way, the early patterns established by the brain pathology present probably are blocked, while some of the more normal pathways are used for locomotion. This conjecture may be established by future investigation. Because these Skates are worn day and night from the start, the training program is uninterrupted and the new pattern has an excellent chance to become established on a more or less permanent basis. These results, naturally, will depend upon the cooperation of the parents of the children.

3. All tightened and contracted structures are stretched with every movement that is made while the Skates are worn.

This device, therefore, has been designed to perform three basic functions. First, to permit ambulation and thereby allow for a high degree of physiologic function while correction is taking place. Second, to in-

crease the base of support by not permitting alternate lifting and lowering of the swinging limb. A gliding motion is substituted for the swinging action. This increases the balance phase of the gait. Third, to stretch shortened structures and allow weak structures to function.

During the past fourteen years these Skates have been used in several thousand cases of in-toeing and out-toeing disorders, and the end results have been uniformly good whenever the doctor has received the cooperation of the parents.

Therapy of In-Toeing Disorders

Talipes Equinovarus: For many years the medical treatment of choice for this deformity has been by use of various plaster of Paris casting technics, with and without wedges, starting soon after birth and continuing for many months until apparent correction has been achieved. Usually correction has not been attained in severe types of talipes equinovarus (nor in talipes equinovalgus or talipes calcaneovalgus). From one to six months after removal of the final cast, the foot has gradually reverted to its original position at birth. Often the next step was surgical intervention. This usually consisted of an arthrodesis which involved the complete or partial destruction of the articulations in the rearfoot and midtarsal joints.

In milder cases, the application of casts to correct the deformity has often been successful. However, a number of factors made this type of therapy objectionable. While the foot and leg were in casts the metabolism slowed down and the structure did not develop properly. This was particularly true when the condition was unilateral, so that the child grew up with the affected foot smaller and the leg thinner. Even in these milder cases evidence of the original deformity could be noted after a period of five to six years. In most of these instances the parents did nothing further to improve the condition.

Metatarsus Adductus: This deformity will respond well to casting in the overcorrected position. Mild cases may respond to shoe therapy, although the author has had little success with this method. The best permanent results can be obtained by use of the single-bar Skate therapy. A treatment period of three months has corrected the disorder without recurrence, in every instance in which the author has used it.

Limitation of Outward Rotation of the Hip Joint: Whenever limitation of rotation, inward or outward, is less than 25 to 30 degrees, simple de-rotation exercises will be sufficient to bring a complete correction of the condition, if the child is less than five years old. The exercises are designed to stretch the affected ligaments and other structures which become involved as the child begins to walk. Any good medical textbook on exercises will include references to such stretching exercises. Young children must be given passive exercises, but older children and adults can do their own active stretching exercises. It must be emphasized, however, that exercises are of no value unless they are given accurately, with the proper amount of vigor, and with unrelenting consistency over a long period of time. The doctor must see the patient regularly for a re-evaluation of the condition, so that additional exercises can be prescribed whenever necessary.

Where the limitation of rotation is severe, the single-bar Skate therapy used to de-rotate the limbs is the most effective form of treatment. Consistent use of the Skates for a three to four month period will correct the most stubborn conditions, and the corrections will be maintained with an unusual degree of permanency.

Compensatory Forefoot Adduction, associated with a Rearfoot Weakness: Wherever such a diagnosis has been established, the doctor should consider the use of Whitman Plates to maintain the foot in normal relationship with the ankle and

leg. Since the Whitman Plate is a training device, it aids the child in developing a patent and stable rearfoot. These plates should be used until it is established that the structures are strong enough to do their own job of maintenance.

Therapy of Out-Toeing Disorders

Talipes Equinovalgus: A description of the principles used in talipes equinovarus applies here equally as well. Whenever the Skates are used, the corrective features are altered to fit the condition treated.

Talipes Calcaneovalgus: The above description fits this deformity also.

Limitation of Inward Rotation in the Hip Joint: A description of the conditions and principles listed in the use of exercises and devices for problems of outward rotation apply here, with the necessary variations.

Calcaneovalgus: Dr. Orr and his associates began treating this disorder in the crib by use of plaster of Paris casts, similar to the type of casting used for a talipes calcaneovalgus disorder. The use of plaster of Paris casting for such problems, however, presents too many associated difficulties that result from such therapy. In severe cases associated with a rotational problem, Skate therapy has been used by the author with a considerable degree of effectiveness, and with lasting results. When confronted with the problem of calcaneovalgus in children past five or six years of age, all proper therapeutic procedures should be considered and used to the fullest extent. Often strapping, physical therapy and specific dancing technics are of direct value.

Shoes by themselves are not of therapeutic help; shoes which have so-called therapeutic devices built into them must be used with discretion. Most of them have devices that while they do no harm, they do very little good. In the main, these children need specific therapy. However, if used, the shoes must be fitted properly for length and width.

Summary

A discussion of in-toeing and out-toeing gait in children has been presented, with a simplified classification of causes, diagnostic procedures, and therapy.

Locomotion and stability are dependent upon normal functioning of the hip joint; therefore, an understanding of the anatomy and physiology of the joint can prove invaluable in planning treatment of these foot disorders.

The basic entities causing an in-toeing gait are talipes equinovarus, metatarsus adductus, limitation of outward rotation in the hip, and compensatory forward adduction associated with a rearfoot weakness. Those causing an out-toeing gait are talipes equinovalgus, talipes calcaneovalgus, limitation of inward rotation in the hip joint, and calcaneovalgus.

The design and application of a device, referred to as 'Skates,' have been described. Its use has brought permanent relief in thousands of cases. The objective of the device is to permit ambulation while correction is going on; to increase the base of support by substituting a gliding motion for the swing action of the limbs; to stretch shortened structures and allow weak structures to function.

Further research is needed in regard to these foot deformities which affect the gait.

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INCIDENCE OF THE SECONDARY EPIPHYSIS OF THE FIRST METATARSAL*

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A STUDY was made to determine (1) the incidence of a secondary epiphysis at the head of the first metatarsal bone in children aged five to twelve years, and (2) if the incidence is as rare as now generally believed.

The existence of an abnormal or pathologic state, or any deviation from the norm, cannot be determined until we have a definite knowledge of what is normal. For example, a diagnosis of osteochondritis of the navicular (Köhler's disease), or retarded development of the midtarsus, could not be made until the rate of ossification of the navicular and midtarsus was known. Many bipartite sesamoids were treated as fractures until it was learned that sesamoids normally may appear bipartite or even tripartite.

The possible increase in susceptibility to pathologic processes at this site, when such an epiphysis is present, must be determined. There are epiphyses present at the heads of the lesser metatarsals, but this area is less subject to trauma than the great toe joint. Improper fitting of shoes and poor selection of shoe styles, "stretch" socks, and restrictive hosiery all tend to traumatize this area, and incite a pathologic process, such as traumatic arthritis, even in the very young. Existence of an epiphysis at the head of the first metatarsal presents the possibility that osteochondritis may occur at this site.

Survey of the literature revealed no studies dealing with this particular problem, but a number of studies of the epiphyses have been reported which relate to the over-all problem.[1-10] Jones[7] stated, "Although the first metatarsal has, typically, a basal epiphysis after the manner of a phalanx, it is by no means uncommon for this bone, like the corresponding bone in the hand, to show a distal epiphysis and so, ossify after the manner of a true metatarsal." Grant[8] said, "A few bones occasionally have epiphyses at both ends, such as the first metatarsal and metacarpal." Colwell[9] said in report of a case of a four-year-old boy without evidence of trauma, "The first metatarsal of the left foot shows a suggestion of a distal epiphysis, but this does not occur on the right side. No morphological importance seems to attach to these unusual epiphyses which, indeed, are regarded as false or pseudo-epiphyses. Köhler[10] noted, "It occasionally happens that an additional epiphysis develops also on the distal end of the first metatarsal."

This scarcity of information in a review of the available literature necessitated sending inquiries to members of the profession. Both Gamble[11] and Lewis[12] failed to find a record of a secondary epiphysis of the first metatarsal, but the latter called attention to Koehler's original book on roentgenology in which he stated, "The metatarsals in general have only one epiphysis. However, occasionally an additional epiphysis develops on the distal end of the first metatarsal." Rasmussen[13] wrote that he found no material on the subject in the archives of the Society of Chiropodical Roentgenology, nor in the X-Ray Department of the Temple School of Chiropody. Yale[14] suggested that the incidence of such a secondary epiphysis must be very small. He said, "I have seen a few of them where the epiphysis was at the head instead of the base. When this occurs, I believe it is an anomaly."

Brachman[15] believes that a secondary epiphysis at the head of the first metatarsal is found in about 15 per cent of cases. Tax[16]

*Award winning paper in the William J. Stickel Annual Awards for Research in Chiropody-Podiatry for 1958. Presented at Annual Meeting of American Podiatry Association, Washington, D. C., August, 1958.

Fig. 1. Left—secondary epiphysis; Center—doubtful; Right—no epiphysis.

went through about 100 x-ray films of children and found positive cases in 12 per cent. Rubin[17] stated that this supernumerary epiphysis occurs occasionally. He said, "My own impression is that the first metatarsal shaft is really an atavistic proximal phalanx, since it seems to have an ossification pattern similar to other proximal phalanges, and, also, that the first metatarsal has been lost in the evolutionary process, and not one of the phalanges of the first toe. This is paralleled in the hand and could account for the prehensility of the first segment in the hand and the prehensility of the first segment of the foot."

Report of X-ray Study

A study was made of the radiographic and clinical examinations of 138 school children 5 to 8 years old. The children were sent from their classrooms in groups of twelve. One child at a time was admitted to the x-ray room. A dorso-plantar exposure was made at a 30-inch distance, 20 MA, 70 K V, ¼ second. The subject then went to the pre-examination room. Five teams of two examiners each sat at tables arranged along two walls furthest from the entrance to the examination room. One child was examined at a time by a team, and no child was permitted to enter the room until a team was free to examine him. Examination consisted of observation of gait, functional tests, subjective examination, objective examination, and special examinations where needed, such as the neurologic status, limb measurement, etc. When symptoms of systemic disturbance were found, or suspected, children were referred to the school physician.

Lack of central facilities for developing the x-ray films necessitated distribution of the exposed films among the participating practitioners. This precluded any standardization of the developing procedure.

Statistical Findings

The radiographs were arranged according to three classifications. The first contained all radiographs with clear evidence of a secondary epiphysis at the head of the first metatarsal. The second class, called "doubtful," included all radiographs in which the epiphysis was in an advanced stage of union with the shaft of the first metatarsal, but showed a visible epiphyseal line. The third class consisted of those in which there was clearly no evidence of a secondary epiphysis. The number of cases found in each classification, and their percentages of the whole group, have been listed according to the sex of the subjects.

Of the total 138 children examined, 112 (81 per cent) were found to have a secondary epiphysis, and 9 (6.6 per cent) were considered "doubtful." Thus, only 17 subjects (12.4 per cent) lacked evidence of the presence of the supernumerary epiphysis (Table I).

Each classification was then divided ac-

TABLE I. Total Cases in Each Classification

	Total Cases	With Secondary Epiphysis	Doubtful Cases	Without Epiphysis
Male	78	72 (92.3%)	1 (1.3%)	5 (6.4%)
Female	60	40 (66.7%)	8 (13.3%)	12 (20.2%)
Total	138	112 (81.0%)	9 (6.6%)	17 (12.4%)

TABLE II. Total Cases in Kindergarten

	Total Cases	With Secondary Epiphysis	Doubtful Cases	Without Epiphysis
Male	17	16 (94.1%)	0	1 (5.9%)
Female	15	12 (80.0%)	2 (13.3%)	1 (6.7%)
Total	32	28 (87.5%)	2 (6.25%)	2 (6.25%)

TABLE III. Total Cases in First Grade

	Total Cases	With Secondary Epiphysis	Doubtful Cases	Without Epiphysis
Male	18	17 (94.4%)	1 (5.6%)	0
Female	17	10 (58.8%)	4 (23.5%)	3 (17.17%)
Total	35	27 (77.1%)	5 (14.3%)	3 (8.6%)

TABLE IV. Total Cases in Second Grade

	Total Cases	With Secondary Epiphysis	Doubtful Cases	Without Epiphysis
Male	22	21 (95.4%)	0	1 (4.6%)
Female	9	6 (66.7%)	1 (11.1%)	2 (22.2%)
Total	31	27 (87.1%)	1 (3.2%)	3 (9.7%)

cording to the grade of school attended by the subjects, from kindergarten through the fourth grade (Tables II to VI). Finally, the percentage of the total group of 138 children in each classification was determined for all grades according to sex (Table VII). There was little significant difference between the percentage findings of secondary epiphysis in children of the various grades of school. The highest percentage of "doubtful" cases, however, was found in Grade 1. The fewest subjects with no evidence of this structure were in the early grades, but the number increased greatly in the third and fourth grades.

Although the total number of boys only slightly exceeded the number of girls, 78 (56.5 per cent) and 60 (43.5 per cent) respectively, it is notable that a positive evidence of the presence of the secondary epiphysis occurred one and one-half times as frequently in the boys as in the girls (64.3 per cent and 35.7 per cent respectively). On the other hand, "doubtful" cases appeared almost eight times as often in girls as in boys (88.8 per cent in girls, 11.2 per cent in boys). Of those showing negative findings, again the girls exceeded the boys (70.6 per cent girls and 29.4 per cent boys) (Table VIII).

The most striking finding in this study was the great prevalence of this secondary epiphysis at the head of the first metatarsal, a condition which seems to be rarely diagnosed or discussed.

It is possible that this study reflects an unusual sample of the population but it seems more likely that this has gone unnoted in routine x-ray studies of the feet. The authors hope in future papers to ascertain if there is any particular significance in their finding of high incidence of secondary epiphysis of the first metatarsal.

TABLE V. Total Cases in Third Grade

	Total Cases	With Secondary Epiphysis	Doubtful Cases	Without Epiphysis
Male	14	11 (78.6%)	0	3 (21.4%)
Female	11	7 (63.6%)	1 (9.1%)	3 (27.3%)
Total	25	18 (72.0%)	1 (4.0%)	6 (24.0%)

TABLE VI. Total Cases in Fourth Grade

	Total Cases	With Secondary Epiphysis	Doubtful Cases	Without Epiphysis
Males	7	7 (100%)	0	0
Females	8	5 (62.5%)	0	3 (37.5%)
Total	15	12 (80.0%)	0	3 (20%)

TABLE VII. Total Percentages According to Classifications and Grades

Total Cases	Grade of School	With Secondary Epiphysis	Doubtful Cases	Without Epiphysis
32	Kinder-garten	87.5%	6.25%	6.25%
35	Grade 1	77.1	14.3	8.6%
31	Grade 2	87.1%	3.2%	9.7%
25	Grade 3	72.0%	4.0%	24.0%
15	Grade 4	80.0%	0.0	20.0%
138		81.0%	6.6%	12.4%

TABLE VIII. Classifications According to Sex

	Total	With Secondary Epiphysis	Doubtful Cases	Without Epiphysis
Male	78 (56.5%)	72 (64.3%)	1 (11.2%)	5 (29.4%)
Female	60 (43.5%)	40 (35.7%)	8 (88.8%)	12 (70.6%)
	138	112	9	17

Summary

The presence of a secondary epiphysis at the distal end of the first metatarsal bone has been rarely diagnosed. A study was made of a group of 138 children from five earliest grades in school. Roentgenograms were made of their feet. It was found that 81 per cent of the films showed the presence of such a structure, and 6.6 per cent more showed a visible epiphyseal line, the epiphysis seemingly having united with the shaft of the metatarsal.

It is suggested that the presence of a secondary epiphysis is a normal expectation and the low incidence customarily reported is due to lack of sufficient data.

The need for other studies of large unselected groups should be made to determine whether the findings in this group are unusual, or whether the incidence of the supernumerary epiphysis is much greater than generally considered and overlooked in studies made of the feet of children.

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"Faith, even more than knowledge, is that by which men live—and die."
Ralph Henry Gabriel
The Course of American Democratic Thought

PEDIATRIC ASPECTS OF YOUTH FITNESS†

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It is indeed a privilege and a pleasure to be invited to participate in this Annual Meeting of the American Podiatry Association. The topic which I have been requested to discuss, Pediatric Aspects of Youth Fitness, is one in which I have had considerable interest for the past several years. It is one in which you, professionally, personally, and as community members, should have an awareness.

Currently the expression "Youth Fitness" is an honorable term, just as "Juvenile Delinquency" is a dishonorable term. At the outset let us clarify the term, Youth Fitness. This should always mean fitness from within the head to the feet. What we mean is total fitness of the total child. This includes physical fitness, mental ability, emotional stability, moral integrity, and spiritual values which all add up to the total well-being of each youth as he reaches adult life.

One might say that fitness of youth of the next generation starts with premarital and prenatal health and fitness of the prospective parents. So, you can see that fitness of youth is not a "cradle to the grave" question, but a before-the-cradle and from there on.

The prerogative of all newborn infants should be adequate neonatal care. Following this, during the pre-school years, every child should receive the necessary medical attention which should include an opportunity for the parents to improve their fund of knowledge which will help in the mutual enjoyment of the development of total youth fitness in each child.

You who are gathered here today are professionally more interested in the physical fitness of each child, but as I have mentioned before, fitness of youth embodies more than the physical aspects of muscle building. We are not interested primarily in raising a generation of Tarzan-like athletes. So, one might properly ask, Youth Fitness for What?

At this point I should like to digress to read you a telegram which very succinctly portrays an answer to the question, Fitness for What? I quote:

> "They say Africa is a continent of strange contrasts. And Mal Whitfield, America's two-time Olympic 800-meter champ certainly agrees. He learned first-hand on a recent State Department goodwill tour. Whitfield was supposed to show a group of natives something about physical training. Mal did a push-up and then asked his group to do likewise. One native after another tried but no one succeeded. Exasperated, Mal tried a different exercise. Just then one of the natives leaped over a fence and disappeared. Whitfield was bug-eyed. The fence was a shade over *seven feet high*. Then another native raced past him and into the forest. 'Where's he going?' Whitfield inquired. 'To catch an antelope,' was the answer. Mal shook his head and walked away muttering to himself, 'And they couldn't do a push-up.'"

The picture of the new father looking through the window of the nursery while holding a baseball glove and bat is all too familiar to all of us. While we may smile in amusement at such a scene, at the same time should we not take a second look and ask ourselves if this is conducive to a home atmosphere for the development of total youth fitness?

I would like here and now to make it

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explicitly clear that I am in favor of sports for all children, and this includes girls as well as boys in the pre-adolescent age group. The more kinds of sports the better, provide they are wholesome and desirable. However, it should be a matter of policy that it be sports for sports' sake, with the child's interest foremost.

I should like to refute a comment that is so often made, that we are denying children competition. Competition can no more be denied an active, growing child than he can be denied the ability to perform many activities. Competition is an inherent part of the growing creature. From early infancy he competes with his environment, with himself, and with his peers. We, as pediatricians, simply ask that in Nature's own way and time, maturation be allowed to follow the pattern which the genes arranged for the particular child. We all had to sit before we could stand; to stand before we could walk, but we did not all do it on somebody's prearranged schedule.

So it is with all activities. Some are slow learners in one activity, and rapid learners in other activities. This is a particular endowment varying from child to child. In sports, each individual child must first learn to master the gross movements; the finer movements, requiring keen coordination, come with maturation. Walking and running are at first awkward, but unless there is some abnormality for which we must all be constantly on the alert, this awkwardness, in its own time, develops into a gracefulness of synchronized movement.

Contrary to some opinions we are not all prospective champs. Some of us are better endowed in a specific field of interest or activity. It is the responsibility of all of us as parents or as leaders in our profession, or simply as keenly interested citizens of the community—which we should all be—to make certain that there is an optimal environment at home, at school, at the playground, and in the church, to develop a sense of values which leads to the total fitness of the total youth. Not only should all children have a diversity of opportunity seasonally to participate in many activities, but to learn how to be good losers as well as gracious winners. They might well have inculcated into them the quotation from Grantland Rice about the query in the hereafter regarding "not whether you won or lost but how did you play the game?" It is here that proper leadership from parents, teachers, recreation workers and other adults becomes of foremost importance. All the efforts of the leadership should be in the direction of the child's welfare, without the consideration of any vicarious reward to the adult.

Part of responsible leadership for youth fitness is adequate medical observation and health protection and care. Perhaps, some of you may think that I am overlooking your special area of professional interest. This could hardly be the case. As a pediatrician I was professionally raised under the tutelage of some hard taskmasters who thought no physical examination was complete unless the infant or child were examined in his bare feet. Many deformities or seeming deformities were observed. It was noticed that within two or three years after walking, many children seem to correct their difficulties without external assistance. It is that small percentage where correction did not occur spontaneously that we mutually have a responsibility to effect a correction. It is conceded by almost everyone that obvious clubfeet of any variety can and should be treated from about a month of age. The overuse of corrective measures, shoes or appliances is viewed with grave concern. Correction of any obvious abnormality should be started well before school age.

As I personally know only too well, "when your feet hurt you hurt all over." Recently I saw a most miserable boy hobble

into the office for a Scout Camp examination. When I inquired as to his limping, he informed me that they were doing practice on ten-mile hikes in preparation for scout camping and that he made this hike in a pair of new hiking shoes. The blisters on both of his feet were enough to make anyone feel sorry. This is but a case in point. All of you probably can cite many examples similar to it.

In conclusion, we may summarize the Pediatric Aspects of Youth Fitness. First would be adequate neonatal and pre-school examination which would consider the physical, mental, and emotional aspects. Second, during the school years periodic health appraisals, with a definite control over follow-up measures for correction of any defects noted, including emotional instability. Proper physical education and sports programs are essential and should be made available to all children. Here again we may note that body-contact sports including tackle football and boxing are not considered as desirable activities in the elementary school age and pre-adolescent child.

It is our responsibility as parents and leaders to try to understand the physiology and psychology of our children and youth, and to so educate and prepare them that we may have a generation of youth who have total fitness from the feet up and become happy, well-integrated adults.

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MANAGEMENT OF JUVENILE FLATFOOT

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THE more one sees of flatfoot in the child, the more one realizes that the major decision in the management of the condition is not so much *how* to treat it, but *whether* to treat it. From my own observations, and those of other investigators, it is evident that a considerable number of these cases display spontaneous postural improvement with age. Sharrard[1] even goes so far as to say that 96% of the children presenting flatfeet in early life will cease to show the condition by age ten years—irrespective of treatment. The earlier work of Bivings[2] also indicated that there is a strong, inherent tendency towards self-correction of juvenile flatfoot. His study had the advantage of having been done over a period of several years, in the same group of children. Bivings' statistics displayed that whereas 73.4% of the group had weak feet at the one to two year level, only 8.2% had the condition when they had attained the five to eight year level. All of these findings would seem to indicate that at least a certain percentage of the flatfoot cases seen in the young child represents what might be termed an "age normal." This is to say that they exemplify a developmental phase through which the foot passes on its way to postural and functional maturity.

Thus it becomes evident that something more than posture alone must be taken into consideration if the juvenile flatfoot is to be adequately evaluated. This "something more" actually embraces several important factors—all of which enter into the diagnostic picture. These are as follows:

1. Developmental Considerations
2. Hereditary Considerations
3. Etiological Considerations
4. Symptomatology (Objective and Subjective)

The preceding will now be briefly elaborated upon.

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Developmental Considerations

It has been well established that certain postural alterations occur in the extremities which may be attributed to developmental maturity or immaturity. For example, bowing of the leg is present at birth, often increases slightly during infancy, and by about the eighteenth post-natal month is converted into a knock-knee. The knock-knee in turn has a tendency to increase slightly at first, usually reaching its maximum degree between the third and fourth years, then gradually decreasing in severity so that by the fifth or sixth year it has usually disappeared.

These same alterations are also seen in the posture of the foot. At birth, the foot will usually present a definite longitudinal arch, although it may in some instances be hidden by adipose tissue. Bivings[2] in this regard has stated: "The arch of the foot is well formed and visible in the vast majority at birth." In early infancy, the child exercises the lower extremities through the medium of kicking. This is performed with the foot in an equinus position. As pointed out by Sweet[3], as far back as 1938, such constant kicking, with the foot in equinus tends to produce some degree of shortening of the gastrocnemius. This point will be again referred to a little further on.

Although the foot, as has previously been stated, presents an arched structure in the non-weight-bearing stage of infancy, such is not the case when weight bearing begins. At this point in its development, the foot displays varying degrees of pronation or flattening. There are several reasons for the posture at this time. Primarily, the supporting structures of the arch are inadequate to maintain an arched type of contour when opposed by the overwhelming stress of body weight and gravitational force. Further, the make-up of the subastragular joint is in itself inducive to pronation—especially in the presence of immature supporting structures. Remember that the talus is superimposed somewhat medially upon the calcaneus. Also, the actual weight bearing surface of the calcaneus is "rockerlike" in its outline. When this osseous relationship is subjected to weight bearing stress, in the presence of insufficient ligamentous and muscular support, the heel is inevitably forced into valgus, and the chain reaction which results in pronation has begun. This is supplemented by the effect of the short gastrocnemius, which further encourages pronation by forcing the foot to evert in order to bear weight. Another contributing factor to the pronation which exists at this time is the position in which the foot is placed by the child as he takes his first hesitant steps. His primary concern at this early phase of locomotion is not propulsion, but balance. Propulsion is accomplished only after some degree of balance is attained. To aid in balancing his body, the infant assumes a stance characterized by wide-spread legs and abducted feet. Such an attitude fosters stability but further aggravates the already existing pronation.

As the foot is subjected to weight bearing and propulsion, the structures concerned with arch maintenance undergo a gradual metamorphosis, and this metamorphosis is accompanied by postular change. The muscles and ligamentous and fascial elements grow stronger through constant use, and their functional ability improves because the child's neurological apparatus is becoming more efficient, and coordination is becoming evident. The chondrous anlage for the bones forming the arch is gradually supplanted by osseous elements, which are better equipped to withstand weight bearing stress. And now one of nature's major miracles begins to unfold: the tiny foot, in spite of the fantastic stress of gravity and body weight superimposed upon it, begins to actually maintain its arched structure in the orthograde posture.

It should be mentioned, in this discussion relative to developmental factors in flatfoot, that the normal developmental process may be impeded by various things. These include frequent illness, vitamin or mineral deficiencies, metabolic disorders, and constantly assumed adverse postural attitudes.

Hereditary Considerations

The prognosis in juvenile flatfoot is influenced in no small measure by the foot type which the child has inherited from his forebears. For this reason, in all possible instances, the child's parents should both accompany him upon his primary visit to the podiatrist's office. The feet of all three individuals may then be compared and some conclusions may be drawn as to the potential possessed by the young feet in question. It is well known that many adults possess a form of familial, mild pronation which under most circumstances is completely asymptomatic. Further, there appear to be certain forms of familial pronation which persistently defy all attempts at correction. Questioning often reveals that these forms have run in the family through several generations. In situations such as this, it is quite possible that the child's feet, through constant care during the formative years of early childhood, may be improved somewhat over the feet of his predecessors. However, it is equally possible that *complete* correction, from a postural standpoint, will never be attained. the responsibility of the podiatrist, insofar as these children are concerned, is to develop the foot to the point of its maximum functional efficiency—and then hope for the best. A point worth remembering here is that a guarded prognosis should be made in situations where the child with flatfeet has a strong familiar or hereditary tendency towards the condition.

Under hereditary factors, the various bone anomalies which predispose the individual to flatfoot must also be considered. These include: accessory scaphoid bones, "wedge" navicular, talocalcaneal bridge, calcaneonavicular bar, abnormal variations in the talar neck or the sustentaculum tali, and the so-called "Morton's Syndrome."

Under hereditary considerations, some mention should be made of the foot which I prefer to call "pes planus." This term is given various applications by various authors. However, in this treatise, it refers to a type foot which presents a plantar surface which is broad and flat, irrespective as to whether or not it is weight bearing. The flattened appearance observed when the foot is at rest is changed practically not at all when weight is applied. Further, this foot form displays little or no heel valgus when it is in the weight bearing position. It is familial; it is usually racial, with a predilection for the negro and for those individuals of Italian and Jewish ancestry; it is asymptomatic; it is an individual normal, and as such requires no treatment.

Etiological Considerations

There are several causative factors which bear discussion insofar as flatfoot is concerned. Foremost among these (and one which incidentally is often overlooked) is habitually assumed posture. By this is meant the attitude which the child usually assumes in sleep, in play and in sitting. The infant who sleeps in the prone position with the feet abducted, and the extremities externally rotated will often develop persistent flatfoot problems. This is also true of the child who sits frog-like, again with the legs externally rotated, and feet abducted. Forms of play which encourage external rotation of the limb and abduction of the foot also encourage the production of a flatfoot problem. Other etiological considerations include: obesity, frequent illness, inadequate footgear, and short heel cord. This last requires a few words of explanation. To explain the

mechanics by which the short heel cord aids in the production of flatfoot, necessitates a primary explanation of certain peculiarities which characterize the ankle joint. This joint is so constructed that extremes of foot extension tend also to invert the foot, whereas extremes of flexion tend to evert the foot. Where the heel cord is short, the only way in which the foot can attain a satisfactory angle of flexion for weight bearing is to evert, so that a few more degrees of flexion are possible. This, of course, abducts the foot and places the heel in valgus—thus encouraging the production of flatfoot. The short heel cord, as has already been explained, is a common finding in infancy and early childhood. It should always be sought for in juvenile flatfoot—and if it is present, therapy must be established for its correction. In the obese child presenting flatfoot, therapy for the flatfoot without therapy directed against the obesity will be of little avail. A foot becomes abnormal either because there is something wrong with its intrinsic structure, or because the extrinsic stress placed upon it (such as excessive weight) is just simply beyond its supportive limitations.

Symptomatology

It is my firm conviction that the most logical basis upon which to judge the relative normality or abnormality of flatfoot in childhood is by the accompanying symptoms. The child whose flatfoot is attended by pain certainly requires treatment. However, pain is not a particularly common presenting complaint in the average case of juvenile flatfoot. Indeed, pain is often not present at all. Posture is frequently a major complaint by the parent, and must be properly interpreted by the examiner. It has already been explained that the pronated foot is a developmental normal in the child under seven years—provided of course that the posture per se is not accompanied by other findings. These findings include: pain (in the foot or the leg); abnormal gait; abnormal shoe wear (such as marked medial heel wear, broken medial counter, excessive wearing of the medial side of the sole, etc.); skin excrescences such as helomata or tylomata which may be interpreted as arising from the foot posture which is present; fatigue, especially in foot or lower extremity, and more specifically, if it occurs at the end of the day; short heel cord; and external rotation deformities in the legs. If the flatfoot present is accompanied by one or more of the preceding symptoms, some therapy should be instituted.

The flatfoot posture itself is of course the chief symptom in these cases, and is in need of a few words of description. We have already discussed the foot form known as pes planus, which has been classified as an individual normal. Lest this condition be confused with the other forms of flatfoot, a few words of explanation are in order. Whereas pes planus presents flattening of the longitudinal arched structure both at rest and on weight bearing, the "pes valgoplanus" (herein referred to as "juvenile flatfoot") offers a well-formed arch at rest. However, when weight is applied to the juvenile flatfoot, the heel rolls into valgus, the talar head becomes more prominent medially, the fore foot abducts, and the longitudinal arch height is very definitely decreased. These changes do not occur in pes planus.

Office Management of the Juvenile Flatfoot

When a child with flatfoot is brought to the podiatrist's office, the following approach is recommended. As has been stated, under ideal circumstances, the feet of both parents should be examined concomitantly with those of the child. This offers some idea as to the hereditary structural possibility which the foot offers. When a comparative study has been made of the postures of the child and his parents, the former should be photographed in a standard weight bear-

ing attitude (anterior and posterior views). This is done to furnish the practitioner with some permanent record of the appearance of the foot and legs prior to the start of treatment. It also offers a standard of comparison for the future. The feet are then x-rayed. Three basic views are recommended in the average case: dorso-plantar, lateral, and a partial weight-bearing oblique. In instances where the patient presents a rigid type of flatfoot with spastic peroneal muscles, an additional view is needed. This is taken through the back of the ankle, with the patient's knee slightly flexed. The patient is standing. The cone is at an angle of 45 degrees. This view is necessary in order to rule out the presence of the so-called talocalcaneal bridge, which is a situation wherein an accessory bone, the os sustentaculum, is fused to the talus and calcaneus, and thus acts as a bridge between the two bones.

The patient is now placed in a sitting position on the edge of the examining table. The extremities are examined for external rotation. This is done as follows: the position of the foot is first observed. If there is an external rotation deformity present in the leg, the foot will hang in abduction. Next the tibial tubercle is checked. In external rotation deformities, this will be found lateral to the mid-line of the leg. In some instances, where an actual torsion or twist exists in the tibial shaft, the tubercle may be *in* the mid-line instead of being laterally displaced. However, where such is the case, if the thigh is stabilized with one hand and the foot placed into the *neutral* position with the other hand (remember that the foot has been hanging in abduction), the tibial tubercle will be seen to be directed somewhat *medial* to the mid-line of the leg. Another finding in external rotation deformities of the leg is that the knee and ankle joints will not be on the same plane in the "at rest" position. The knee joint will function in a direct antero-posterior plane whereas the ankle joint will perform in a plane somewhat lateral to direct antero-posterior. It should also be mentioned that the patient presenting external rotation of the leg will walk with the feet strongly abducted.

The next step is to check the length of the tendo-achilles or heel cord. This is done as follows: The entire extremity being tested is supported by the examining table. The examiner now places one hand firmly over the front of the knee, and exerts downward pressure upon it. This locks the leg in full extension. Next the foot is strongly inverted, and, still held in the inverted position, is forced back into flexion upon the leg. When this is done, care should be taken to flex the *entire* foot, and not just the fore-foot.

At this point the following have been accomplished:

1. The hereditary aspects of the child's foot have been determined.
2. X-rays have been taken to rule out the possibility of bony anomalies being present in the feet.
3. Photographs have been taken and a standard for comparison has been acquired.
4. External rotation has been investigated.
5. The length of the heel cord has been noted.

Needless to say, a case history has been taken previously, which indicates the patient's status in regard to general health, subjective complaints, development (mental as well as motor) and whether the condition has suddenly developed or has been present since first walking. Also included in the history is a record of the child's present weight, and information as to whether there has been any recent gain or loss of weight. Shoe wear has also been determined. Gait has been noted.

On the basis of the material on hand we should now be equipped to determine whether or not treatment is indicated. If it is felt that the case in question requires

no treatment, the only honest thing to do is to so inform the parent. This is done firmly, and with assurance. It may be suggested that the child be re-examined in some specific period of time—for example three months. Where treatment is required, the following is suggested.

Treatment

There are, of course, many therapeutic approaches to the juvenile flatfoot. There are also many strong opinions as to treatment method. These thoughts are chiefly empiric—which is to say they are based upon personal experience. The treatment as herein presented has been satisfactory in my own experience, and thus is also largely empiric.

The successful control of the posture present in these cases is dependent upon constant maintenance of the foot in the corrected position. In my practice this is accomplished by placing a permanent (as opposed to removable) celastic reinforcement in a long counter, rigid shank shoe. This reinforcement has a medial flange extending from the mid-point of the calcaneus, medially, to a point immediately proximal to the first metatarsophalangeal articulation. It also has a lateral flange which extends from mid-heel forward to a point just proximal to the base of the fifth metatarsal. This celastic device resembles a Whitman appliance in shape—but not in function. It is placed in a new shoe, and allowed to harden for twenty-four hours before it is worn. The child is seen in one week following the institution of the corrective device, with the proviso that no complaint develops in the meantime. Upon his return to the office, the child's shoe and appliance are checked, and he and his parents are questioned as to whether or not there has been any discomfort from the treatment. If none has been experienced, the patient returns in one month, when the shoe wear is examined and the state of the insert is checked. If there is no complaint, and the shoe wear and appliance are satisfactory, the child is checked at three-month intervals.

In instances where short heel cord exists, it may be treated by passive exercise, done by the parent several times daily. The parent must be carefully instructed as to the method of exercise and should actually perform the prescribed movements several times, in the presence of the practitioner. In my experience, active exercise—that is, the type the child himself performs—is of little value. He neglects to do it regularly, and does not stretch the muscle satisfactorily, since this is usually accompanied by some discomfort. If desired, the prescribed exercise for short heel cord may be supplemented by the use of a Fay or Thomas Bar. These devices place the foot in mild flexion, thus placing a degree of stretch upon the calf group.

If the flatfoot is accompanied by external rotation deformity in the leg, this is controlled as follows: in children under age five years, the Dennis Browne splint is used at night, to control the sleeping posture. The foot is placed in 20 degrees of adduction to start, and gradually increased to greater adduction until 45 degrees is reached. The angled heel is of value in controlling walking posture. Sitting posture must be supervised constantly by the parent. In some cases, a wooden bead may be sewn to the medial side of the shoe, in the area of talar head. This produces discomfort if the child sits with the foot abducted and discourages this position. Rotational problems in older children are extremely difficult to control. In many instances internal rotation exercises may be of some help, and the same is true of the Hauser Bar. However, in just as many cases these will be of no value at all. The ideal time to correct rotational problems is in very early childhood.

The subjective and objective symptoms attendant to flatfoot will usually disappear in a matter of weeks. The posture per se requires far more time for full correction.

In many instances it will resolve into a matter of years, rather than weeks or months. This factor will of course be influenced considerably by the age at which treatment is instituted, and by the severity of the deformity.

The deformity usually referred to as "rigid flatfoot with peroneal spasm" or sometimes simply as "spastic flatfoot," has not been discussed in any detail in this treatise. This condition is by no means common, and has no place in a discussion of the "everyday type" of flatfoot such as has been taking place here. Suffice to say that this spastic form of flatfoot, when present, must first be carefully examined for arthritis in the tarsal area, and for bony fusions. The usual treatment consists of manipulation under anesthesia, followed by casting. The walking cast is usually continued for about six weeks, after which exercise and the usual flatfoot therapy is employed. These patients are most often overweight adolescent boys.

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FOOT HEALTH REPORT OF A SCHOOL HEALTH SERVICE*

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THE Annual Report this year is somewhat more ambitious than previous ones inasmuch as it is based upon the collated reports of the past twelve years. The object is to survey the findings and correlate them to a practical clinical approach in prevention and correction. As preventive medicine today is a number one priority, foot examinations and surveys play a valuable part in establishing definite trends and aetiological factors. The establishment of the Foot Health Service for school children in Salford was based upon a preliminary survey of some 5,000 children which was initiated by the Principal School Medical Officer. This survey was carried out during 1946/47, the object being to ascertain the general standard of foot health on commencing school and the degree of deterioration during school life. For the purpose of the survey three standards were set: (a) normal; (b) slight defect; and (c) marked defect requiring treatment.

Comparing the figures for the school entrants, age-group 4-6, with those for school-leavers, age 13-14, the percentage of very badly-fitting shoes (those at least two sizes too small) were fairly constant. Entrants 6.2%, leavers 5.6%. The incidence of defects in the feet, however, was much higher in the older children in each type of defect. On entrance, no child was found with any marked defect of the metatarsal arch or nails. Corns and callosities were very few, and none were of a serious character, whilst no case of verruca was noted. Amongst school-leavers, however, the incidence of metatarsal defects was 1.9%, nail defects 0.6%, verruca 1.4%, corns and callosities 2.3%, under classification of marked defects. Hallux Valgus rose from 0.4% in school entrants to 4.2% in leavers. Weakness of the longitudinal arch analysed to only 0.4% on entrants compared with 3.8% on leavers, these figures relating to

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*From the report of the Principal School Medical Officer, J. L. Burn, M.D., D.Hy., D.P.H., School Health Service, Education Committee, City of Salford, England, for the year ending December 31, 1957.

serious defects only. Comparative tendencies were shown in the slight defects except in two instances where the deterioration was exceptionally marked, for instance, corns and callosities from 2.4% to 11.9%, whilst in the case of Hallux Valgus there was the astonishing rise from 6.6% to 26.4%. Another important finding was that the proportion of children with perfect feet on entry was 62.4%, but had deteriorated to about only half, 33.4%, on leaving.

On investigating the fitting of shoes it was found that 26.9% of the girls and 22.3% of the boys were wearing shoes one size too small. This, however, was not a serious matter in the case of growing children as it still left one size of clearance. It was, however, found that 10.3% of the girls and 5.4% of the boys were wearing footwear at least two sizes too small meaning, of course, that there was no toe clearance at all in these cases. In considering the condition of the footwear, investigation revealed that 12.1% of the girls, 13.6% of the boys, had shoes in poor condition, and 4.8% girls, 8.5% boys had shoes in a very bad state of repair.

The marked deterioration in the condition of children's feet during school life shown by the above survey established the necessity for both preventive and corrective measures.

Over the years from 1947 to 1957 gradual development of the Foot Health Service has taken place. Three clinics were established, evenly distributed through the city to cope with cases referred for treatment from the schools as a consequence of foot surveys and examinations, and cases referred by school medical officers and health visitors. Commencing with one session per week the service has now grown to eleven sessions per week, employing three part-time chiropodists, and this is by no means adequate to cope with the demands. As Consultant Chiropodist I have carried out a regular weekly survey going systematically through the schools. This service could not be extended as it had to be kept in line with the capacity for treating cases referred. The collective figures for 1946-7 are 5,101. For that survey I was assisted by a team of senior students from the East Lancashire Foot Hospital School of Chiropody. Subsequent surveys were carried out with the assistance of a clerk. I think the latter system is the better method as by the examination being carried out by only one person a consistency of standard is maintained, thus contributing towards greater accuracy in the ultimate findings.

From 1948-57, 24,331 were examined as follows:—

1948	1,253
1949	1,009
1950	1,169
1951	1,338
1952	3,532
1953	2,092
1954	3,619
1955	4,733
1956	2,510
1957	3,076

The total including the first survey being 29,432.

Whilst annual reports have been rendered each year containing a statistical report it is interesting to consider the collated findings resulting from the examination of nearly 30,000 children. The reason why I consider this is important is that one frequently sees conclusions arrived at on the basis of small surveys. Whilst this may be useful in considering very rare conditions, surveys, in general, if they are to serve a useful purpose, should be based upon very large numbers.

In dealing with the collated figures of my own surveys it is interesting to note certain factors. For instance, when one visits the clinics and observes the considerable number of children receiving treatment of verruca pedis, one may be inclined to consider this looming up as a serious

CHIROPODY SURVEY SUMMARY, 1957

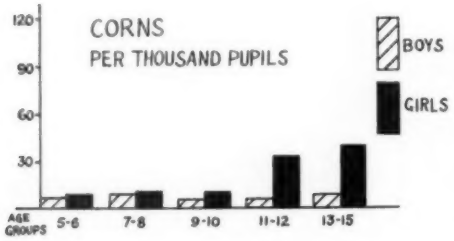
AGE GROUP (Years)	5 to 6				7 to 8				9 to 10				11 to 12				13 to 15				TOTAL				
SEX	M		F		M		F		M		F		M		F		M		F		M		F		TOTAL
Defect Group	b	c	b	c	b	c	b	c	b	c	b	c	b	c	b	c	b	c	b	c	b	c	b	c	
CORNS	—	4	1	2	—	2	—	2	—	2	—	2	—	4	—	19	—	5	1	28	—	17	2	53	72
VERRUCA	—	2	—	—	—	—	—	—	—	2	—	4	—	5	—	8	—	2	—	3	—	11	—	15	26
WEAK LONG ARCH	47	15	33	16	25	14	31	26	22	12	49	24	22	16	44	56	20	19	73	51	136	76	230	173	615
FOOTWEAR DEGREES OF ACCURACY IN FITTING	53	25	66	42	41	15	70	32	33	20	90	34	66	10	132	97	67	16	163	148	260	86	521	353	1220
DEFECTS OF LESSER TOES	12	35	8	34	4	20	10	11	5	11	5	15	2	9	16	24	5	6	23	31	28	81	62	115	286
HALLUX VALGUS	26	3	25	9	20	3	34	7	24	2	57	18	40	—	78	29	68	2	152	75	178	10	346	138	672
NAILS	—	—	—	1	—	—	—	—	—	1	—	—	—	2	3	1	4	3	2	3	4	6	5	5	20
TOTAL	138	84	133	104	90	54	145	78	84	50	201	97	130	46	273	234	164	53	414	339	606	287	1166	852	2911
TOTAL NUMBER OF CHILDREN EXAMINED MALE AND FEMALE	310		320		209		279		214		272		250		419		269		534		1252		1824		
TOTAL NUMBER OF MALES AND FEMALES EXAMINED	630				488				486				669				803				3076				

b = slight defect

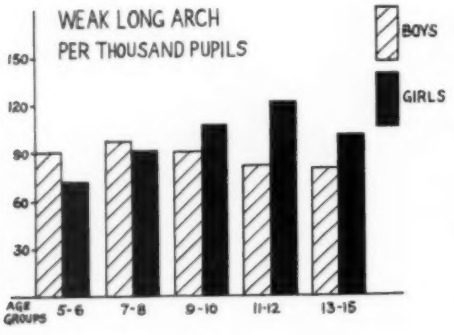
c = marked defect requiring treatment

problem, but when one places this lesion in proper perspective, one finds that on the basis of the twelve years' survey the percentages are as follows: Age group 5-6—only three boys were found to have verruca, amounting to 0.07% and one girl, amounting to 0.02%, or collectively for the group 0.05%. In the remaining age-groups the collective results were as follows: 7-8 = 9 = 0.15%; 9-10 = 39 = 0.80%; 11-12 = 44 = 0.93%; 13-15 = 27 = 0.94%.

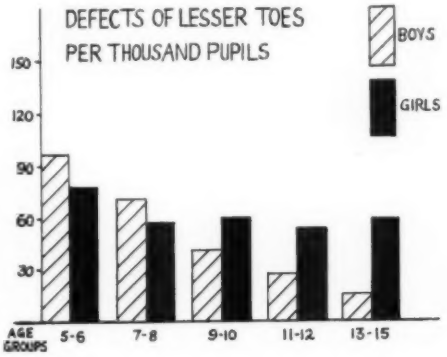
The total number of children found with verruca during the school examination was 123 or 0.42% of the total children examined. Another interesting factor which emerges is that 1.12% boys were discovered to have corns in the age-group 13-15, 2.60% of girls were found affected in the same age-group by these lesions.



Of the total number of children examined in all age-groups, 2,723 had marked weakness of the long arch amounting to 9.22%. This is very substantial, and one of the commonest defects found in children. On assessing the various age-groups it was found that there was a fairly even balance. The variation at no point exceeding little over 2%.

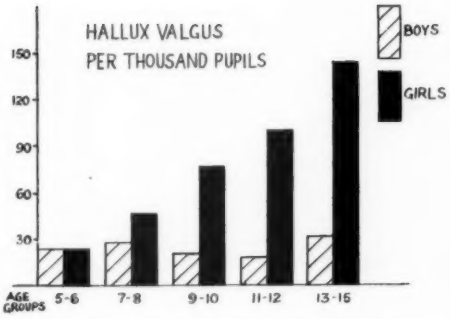


In the case of defects of lesser toes it is interesting to note that in the age-group of 5-6 there is a slight increase of boys over girls, 9.68% boys, 7.81% girls. The variation in this age-group cannot be regarded



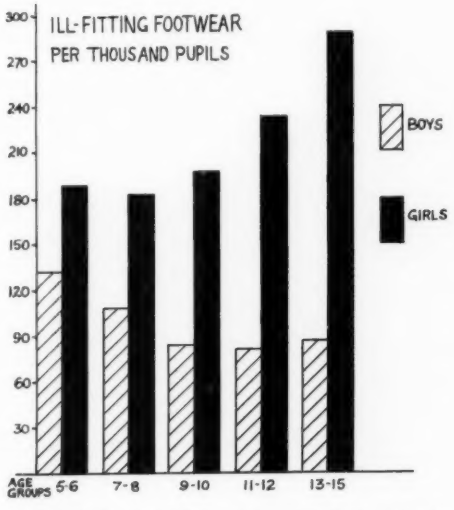
as significant, as both boys and girls wear similar footwear. That the percentage is, nevertheless, substantially high is accounted for by the fact that the wide articular spaces in the joints of young children allow considerable distortion without serious discomfort. It will be noted, however, that at the ages from 9-15 there is a distinct decline in the percentage of defects in the case of boys, dropping (in the 13-15 age group) to 1.54%; whilst in the case of girls it is retained at the substantially high level of 5.91%, practically 6%. The deterioration in the shape and design of girls' footwear covering these age-groups undoubtedly accounts for this.

Another significant difference between girls and boys is noted in the case of Hallux Valgus. In the age-group 5-6, boys and girls are almost identical in the percentage of defects, 2.40% and 2.39% respectively. In the case of boys, there is an increase in the 13-15 age-group, which stands at 3.17%. In the case of girls, however, there is a continuous persistent rise from the age of 7-15, where as in the 13-15 age-group it stands at 14.5%. I think that the best way of giving the answer to this problem, as to



how it affects the girls, is to study the figures covering the degree of accuracy in the fit of footwear. In the case of boys, there is a steady fall in age-groups 5-10, where it stands at 8.56%, this remaining more or less static up to the age of 15, where as in the age group 13-15 it stands at 8.61%. In the case of girls, however, the figures are very significant, commencing at 18.89% there is a constant rise reaching the alarming figure of 28.9%. This is showing a shortage of at least two sizes in footwear. If this is coupled with the unsuitability of shape and design I think the true answer is provided.

In discussing the unsuitability of girls' shoes one must first consider the vogue for casuals extended over a considerable period of time. These loose, low fitting shoes provide no support for the young foot. The foot is not held back into the heel of the shoe by any form of lacing, the tendency being for the foot to slide forward into the fore part of the shoe. In such footwear the hallux develops a valgus deviation and the lesser toes are formed back into a clawed or retracted position. This type of footwear provides no bracing whatever for the instep, allowing an inward rolling of the medial arch to take place without restriction. Another form of footwear worn by teenage girls for a considerable time is the sling-back. Shoes many sizes too small are frequently worn in this design of footwear. The heel of the foot protruding over the heel of the shoe, whilst the toes are bunched together in a distorted mass in a meshwork of leather strappings. To complete the dismal "Rake's Progress" in the footwear of teenage girls one arrives at the ballerina shoe, which is a canvas, synthetic suede, or velvet upper and a fused rubber sole. They are so shallow in construction that the only hope of retaining them on the feet is to wear shoes at least two sizes too short. These, coupled with the wearing of tight-fitting conical-shaped hose, in the case of the older teenagers, results in the alarming statistical finding previously referred to.



Parallel with the above statistical findings a report of the past six years, covering a total of 19,562 children revealed the following: that 0.53% of the children examined showed a hallux varus deformity, whilst it was interesting to note that pes cavus, mainly congenital in origin, was noted in 1.85% of children. Quinti varus (overlying fifth toe) occurred in 0.42%, Hallux Flexus in 0.17%, short first metatarsal 0.19%, web-toes 0.37%. Some 1% of children were found wearing rubber wellingtons in the summer, whilst approximately 3½% were wearing plimsolls or sandals in the winter. These latter two factors were investigated because the detrimental effect of rubber footwear in sum-

mer constituted a definite link in the upward trend of tinea pedis. Plimsolls and sandals in the winter are indeed most unsuitable footwear for this period of the year. Most of the children wearing this form of footwear out of season were found to have feet cold and clammy, and legs and feet cyanosed. Three and a half per cent is a substantial number and steps to discourage this practice should be taken promptly.

Having collated our statistical findings I propose to outline the measures taken to deal with the various defects, also to establish and maintain a generally high standard in the foot health of the school child. The first step is to establish a system of preventive measures in the hope of eliminating many and substantially reducing the numbers in the more prevalent defects. This is best achieved by educating both the child and parent in the simple rules of foot hygiene, and in the case of parents, disseminating sound advice on the choosing of children's footwear.

The wearing of plimsolls other than for gym should be discouraged, even for this purpose this form of footwear should not be interchangeable and should be individual to the child. This will be a useful measure in countering tinea pedis, a condition which has shown a distinct upswerve coincident to the increase in the use of rubberized and plastic footwear. The wearing of rubber wellingtons in the summer should be discouraged for the same reason.

In the case of foot hygiene this can best be dealt with by talks in the schools, such talks being given by a teacher, health visitor or chiropodist. The following simple rules of hygiene should particularly be emphasized: the daily washing of the feet—warm water, a good antiseptic soap—it is important that the feet should be thoroughly dried, particularly between the toes. A little powder sprinkled in the interdigital spaces will assist in absorbing any remaining moisture and thus prevent friction and maceration between the toes. Socks should be changed frequently as is reasonably practicable. To ensure that there is ample toe-room a good guide is to have an inch of spare clearance of children's socks to allow for the push back which occurs when the shoe is being placed upon the foot. Shrunken hose contributes substantially to hallux valgus deformity and defects of the lesser toes. Woolen hose is more suitable than cotton as it is more springy and stretches more freely and does not become stiff and hard as in the case of cotton hose when it becomes saturated with moisture.

As it has been established that footwear faulty in fit and design plays a major part in minor defects in the feet of children, it is essential that the fullest possible advice should be available to parents on the correct fitting and suitable types of shoes for children. Just as human beings in general vary in type so do the feet of children and we have the long slender foot and short broad foot, and if their feet are to be correctly clothed the size and fitting of the child's shoe should be correctly related to the type of foot. It is, therefore, advisable that the shoes should be selected from footwear which has a range of fittings as well as sizes. A simple rule by which the correct size of shoe can be related to the child's foot is by the use of the standard size stick. The shoe should be two clear sizes above that indicated on the size stick when the foot is measured weight-bearing. A shoe fitting correctly from heel to ball, which laces well up to the instep, will ensure the heel of the foot is retained in the heel seat of the shoe and will not creep forward. It will also ensure that the ankle and instep are firmly braced and supported. If a proper natural-form last is chosen freedom for the toes will be ensured. Stability of the child's foot is further assisted if the shoe has a flared

heel. Information of the above type is freely available in several pamphlets that have been published from time to time by the Foot Health Bureau and the Shoe and Leather Research Association. These are issued to interested parents and prove an invaluable guide in the choosing of footwear for the growing child.

In concluding my remarks on footwear I would suggest that where rubber or composite soles are chosen the insoles should be of leather, as this absorbs the aqueous and toxious matter excreted from the pores. Where the insole is of plastic or rubberized construction this toxic excretion tends to condense, keeping the feet in a humid and unhealthy condition, with the skin relaxed and the pores dilated and thus more susceptible to infection.

Parallel with preventive measures over the years I have succeeded in devising simple corrective techniques for various minor defects of children's feet. For hallux valgus and lesser toe defects I have designed a series of simple strip rubber devices, which exert traction or provide splintage which induces correction in a relatively short space of time. The advantage of these appliances is that they are simple in design and easy to make, quite inexpensive, in fact it is doubtful if they would cost any more than the conventional felt and plaster. They can be taken off at night or for the purpose of washing and if kept clean and dusted with powder when applied they have a life of several months, dispensing with frequent visits to the clinic and at the same time showing considerable economy in dressing costs.

(ED. NOTE:—At this point in his report the author describes some devices and therapies for prevention and treatment of certain foot problems.)

I was recently invited to lecture to Region 3, National Association of Chiropodists of America at their Convention in Atlantic City. I was specially invited to lecture on the subject of the Foot Health of the Child and the Foot Health Service operating in Salford. They were deeply interested in a service developed in this city and particularly the methods developed and employed for corrective treatment of minor defects of the feet and the statistical report on the examination of the feet of nearly 30,000 school children over the past twelve years. This report based on continuous surveys will, it is hoped, prove of considerable value in assessing various trends and factors in relation to the foot health of the child associated with such matters as environment, footwear selections, age groups, etc., and every endeavour has been made to include the basis of this statistical survey in this report, as it was felt that it would prove of considerable interest.

54 Victoria Street

Comment

John T. Sharp, D.S.C., Chairman,
A.P.A. Children's Foot Health Committee

In attempting to evaluate the survey conducted by Charlesworth, one cannot but be impressed with the sheer magnitude of the work. Certainly it must stand as a major contribution to current podopediatric knowledge. I know of no published comparable survey (from the standpoint of the number of children examined) in this country—although it is quite possible that the work done last year by the American Foot Health Foundation may offer a favorable comparison in numbers, if not in accuracy of statistics.

In commenting upon the actual *method* of conducting investigations of this sort, Charlesworth mentions that the "pilot" surveys done in 1946 and 1947 were performed by himself and a group of students from the East Lancashire Foot Hospital School of Chiropody. The remainder of the surveys, from 1948 to 1957 inclusive, were conducted only by himself and one clerk. In comparing the first manner of approach

with the second, Charlesworth makes this pertinent comment: "I think the latter system is the better method as by the examination being carried out by only one person a consistency of standard is maintained." In essence, I am completely in accord with this statement. The only way in which uniformity of statistics may be attained is through the medium of a standard method of examination routine and a common interpretation of pathological findings. However, I do feel that it is possible to acquire satisfactory statistical material even though investigations are performed by a number of examiners provided:

1. A standard examination procedure is adhered to by all.

2. The investigators are carefully trained to evaluate existing pathologies in an identical manner.

The Charlesworth Report indicates a marked increase in hallux valgus cases concomitant with an increase in chronological age. This seems consistent with findings in this country. As he infers, it is probable that the undesirable change in footgear which occurs with the child's having something to say about the type shoe he, or especially she, wears is largely responsible for this increase. However, it is a fairly common feeling in this country that the large proportion of hallux valgus deformities are primarily secondary to the deformity referred to as metatarsus varus primus. It is unfortunate that Charlesworth apparently did not take this latter abnormality into consideration. It would have been interesting to compare the hallux valgus percentage with the proportion of metatarsus varus primus cases.

It is also interesting to note that Charlesworth found a slight increase in "arch weakness" as the patients increased in age. This finding is apparently not consistent with that of the British orthopedist, Sharrard, whose report which appeared in one of the 1958 issues of "The Practitioner" stressed the fact that in his experience juvenile flatfoot tended to decrease spontaneously with age.

The complete health report indicates that there were 8851 periodic general medical inspections of which 1768 were referred for orthopedic examination. Of these, for foot conditions, 61 pupils required treatment and 326 required only observation. Charlesworth's series of 3076 examinations reveals that in the "weak long arch" category alone 366 had a mild defect and 249 had a marked defect requiring treatment.

The directness of the Charlesworth Survey is admirable. It personifies what should be the essential purpose of all investigations of this type: the separation of those children in need of foot care from those not in need of such care. This factor is unfortunately often overlooked in the surveys which have been done in this country.

Mr. Franklin Charlesworth is to be complimented upon a capable investigation into juvenile foot problems, one which is unencumbered by unessential and inconsequential adornments.

KRANTZ *(Continued from Page 110)*

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CLINICALLY SPEAKING

A place for the more informal presentation of reminders, suggestions, notes, observations and technics of value in office practice. Your contributions of short manuscripts or illustrative case histories will determine this section's usefulness.

AN ORTHODIGITAL SPLINT FOR VALGUS OF DISTAL PHALANX OF HALLUX

HERBERT L. STERN, Pod.D.
New York, N. Y.

CONSEQUENT to the upsurge in popularity of the so-called "ballet slipper" type of footwear in adolescents, a new deformity of the hallux appears more frequently.

Clinically, the great toe shows a partial displacement laterally of the distal phalanx on the proximal phalanx with or without an accompanying plantar deviation. A rather large bursa becomes evident, acute in many instances and with inflammation. In one of our cases, a serous exudate precipitated the office consultation. X-ray study reveals the dislocation (Fig. 1 left) which is palpable, and the usual complaint of the child is the inability to continue wearing those "adorable little slippers." (We speak of a counterless, shankless, flexible slipper which, according to the maker, is supposed to fit the foot "like a glove.")

Nine cases came to our attention during the past year. All involved girls between the ages of seven and twelve. Eight cases were bilateral. Three cases were brought to the office because of onychocryptosis secondary to the deformity. One case included the infected bursa previously mentioned. In five instances the parent did not like the appearance of the toes.

Five cases were successfully treated in the following manner:

a. Discontinuance of slipper type shoe, replacement with a blucher tie oxford.

b. Construction of a night splint similar to the device frequently used in hallux valgus therapy. However, in this instance, counter pressure is necessary at the lateral side of the distal phalanx and medial side of the proximal phalanx. In order to achieve this, an appropriate-shaped piece of No. 125 celastic is "cut-out." The material is activated with acetone and literally wrapped around the hallux. Partial drying is done with a hot-air blower (dryer) and

Fig. 1. Valgus of distal phalanx of hallux. Left—before treatment. Right —4½ months later.

the semi-rigid celastic removed from the foot. The patient is discharged for the remainder of the day.

Thin strips of 1/8" adhesive felt are placed to create the needed counter pressure. The entire appliance is covered with moleskin and dipped in natural latex. A leather strap is incorporated into the appliance at the mid-tarsal area to hold the splint firmly in place.

c. Parent cooperation is essential. Following a gradual break-in period, not to exceed one week, the patient is instructed to wear the splints nightly.

"Follow-up" care consists primarily of the application of strips of moleskin at opposing sides of the anterior section of the appliance. Repeat x-rays at six week intervals.

Correction of the deformity takes place from two to five months (Fig. 1 right) depending upon (1) patient cooperation, (2) age of the patient, (3) Severity and longevity of the deformity.

736 Allerton Ave.

JOURNAL
OF THE
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A. RUBIN, D.S.C., Editor

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THE PRESIDENT'S PAGE

On various occasions I have urged our members to improve the quality of service given to patients, emphasizing that palliative care alone is not in keeping with modern practice of podiatry-chiropody.

We in practice must constantly strive to keep abreast of all research and development in the medical, physical, and surgical fields. We must provide the finest rehabilitative and prophylactic foot care for the public. We must keep pace and assume the responsibility that goes hand in hand with our privileges. We must be worthy of the trust placed in us by the public, the state and national governments, and the armed forces.

To further emphasize this point, I wish to direct your attention to an article which appeared recently in a British Chiropody Journal covering correspondence in the matter of the chiropody profession in Great Britain being accused of providing "only palliative care." A re-check on the situation offered the following possible solution, that perhaps there should be two classes of chiropodists in Great Britain, (1) those who provide palliative care, and (2) those better trained to provide rehabilitative care, to be associated with hospitals, and to be paid accordingly higher than those providing palliative care.

This analysis of the chiropody profession in England, no doubt stems from the fact that the chiropody profession is being readied to be part of the socialized medical system in England.

All this is just one more reason that we must have a unified profession, striving for one thing, better foot care for the American public.

G. E. GUENZLER, D.S.C.

CHILDREN'S FOOT HEALTH COMMITTEE

All members who are officially attached to public or private school boards and/or are routinely conducting foot health examinations as a member of the school staff are urgently requested to furnish this information to the Chairman of the Children's Foot Health Committee, Dr. John T. Sharp, 1424 Old York Road, Abington, Pennsylvania.

SMORGASBORD OF INFORMATION

Scanning the programs being presented at meetings within the profession, one is impressed by the wealth of information being spread before our profession. All that the member has to do to partake of this hearty meal is to attend. The variety and scope of presentations tempts even the most jaded appetites.

Clinical and office experiences, instructional papers, research reports, public service and education information, audio-visual presentations, panels, symposia and discussion groups make up the programs. At our 1958 annual national meeting, there were more than 100 individual program participants. Many of these are giving expanded presentations at regional and state meetings.

The experiences gained at that meeting (and the very fine complete reports prepared by the 1958 Committee on Arrangements) have laid the background for an even better 1959 program. As was done last year the complete program will be published in the Journal (earlier this year) well in advance of the meeting so that members may plan their own personal attendance.

This issue of the Journal is devoted to Podopediatrics and three of the papers were presented at the 1958 annual meeting. Two of these papers are Stickel Award papers. May we suggest that you prepare a paper on your favorite topic, citing your experiences and/or research, for the 1959 William J. Stickel Annual Awards for Research in Chiropody (Podiatry). In this way you may serve at least one dish at our annual Smorgasbord of Information.

FOOT CARE FOR CHILDREN

Charlesworth's report on the state of the foot health of the children in an Englirh School System in this issue of the Journal is a very illuminating study and points up the many needs for our services. Other papers in this issue report on some methods of clinical management. Some of the papers tell of some research findings. All of these illustrate facets of programs to insure better children's foot health and care.

We must learn the extent of the problem by mass examinations and pinpoint specific problems by special complete group examinations. We must encourage and participate in research. We must report our clinical knowledge and experiences. And finally, do all this while giving the best possible service to our pediatric patients.

FOOT HEALTH WEEK — 1959

Through inadvertent error the incorrect dates for Foot Health Week were given in the February issue. Please note that the correct dates are **MAY 22-29, 1959.** As usual, the event is sponsored by the American Foot Health Foundation.

WASHINGTON REPORT

CONGRESS CONSIDERS:

Keogh-Simpson Bill (HR 9-10)

THIS same bill passed the House last year and was then known as the Jenkins-Keogh Bill (subsequently it died in the Senate Finance Committee). Within a few weeks the House Ways and Means Committee will approve this bill and send it to the floor of the House for a vote. Provisions of this bill would permit tax deferment for portions of income channeled into pension plans. Action by the House will be taken without new hearings, since they were held last year. The statement of the American Podiatry Association submitted at those hearings appeared in the March 1958 Washington Report.

According to Mr. Keogh, "The Bill must be rated as an excellent bet for passage by both Houses of the 86th Congress—quite possibly in the first session. From all indications, there is even greater support for our program this year than in previous years."

FEDERAL DEPARTMENTS AND AGENCIES

National Defense Student Loan Program

Federal funds totaling 6 million were recently allocated by the U. S. Commissioner of Education, Lawrence G. Derthick of the Department of Health, Education and Welfare. The student loan allocations, made through the Office of Education's Division of Higher Education, went to 1,227 colleges and universities in all 49 states, the District of Columbia, Hawaii and Puerto Rico. College students and high school graduates wishing to obtain a student loan may apply to any of the institutions to which funds have been allocated. Each such institution will handle its own student loan fund and will select the individuals who will be granted loans to enable them to continue their education.

Allocations for individual institutions were made on the basis of their request as related to the total requests of that state and the student loan allotment for each state. Among those institutions allocated funds were the California College of Chiropody ($3,594) and the Chicago College of Chiropody ($1,330).

Dictionary of Occupational Titles

The listing of all occupations appears in this publication of the U. S. Department of Labor's Bureau of Labor Statistics and a new edition is published every ten to fifteen years. Supplements listing changes are published from time to time between editions of the Dictionary of Occupational Titles. Last summer we were contacted by the Bureau of Labor Statistics to review their revised definition of our profession. During January of this year we learned that the code number, 0-52.01, indicated a semi-professional status. We therefore arranged a conference in their offices. The new revised definition is listed below and it will be noted that we have been assigned a new code number, 0-39.901, which reflects a professional status:

PODIATRIST (Medical Service) 0-39.-901. chiropodist; orthopedic specialist. Diagnoses and treats diseases and deformities of human foot: Diagnoses foot ailments such as tumors, ulcers, fractures, skin or nail diseases, and congenital or acquired deformities, utilizing such medically accepted methods as urinalysis, blood tests, and x-ray analysis. Treats deformities such as flat or weak feet and foot imbalance by mechanical methods such as whirlpool or paraffin baths, or by electrical methods such as short wave and low voltage currents. Treats conditions such as corns, calluses, ingrowing nails, tumors, shortened tendons, cysts, and abscesses by surgical methods including suturing, medications,

and administration of local anesthetics. Does not perform amputations of the foot. Corrects deformities by means of plaster casts and strappings. Makes and fits prosthetic appliances. Prescribes corrective footwear. Refers patients to PHYSICIAN when symptoms observed in feet and legs evidence systemic disorders such as arthritis, heart disease, diabetes or kidney trouble. May treat bone, muscle and joint disorders and be known as PODIATRIST, ORTHOPEDIC; children's foot diseases and be known as PODOPEDIATRICIAN, or perform surgery and be known as PODIATRIC SURGEON.

This revised listing will appear in the next edition of the Dictionary of Occupational Titles which will be published within three to five years and will be incorporated in any supplement which will appear in the meantime. All inquiries which have been coming into Headquarters since this revision have received the new information.

Small Business Administration Loans

Loans in December, 1958, by this agency included $15,000 to Dr. Charles M. Hammonds, chiropodist of Brownwood, Texas. Other loans during December included Drs. John B. Bleyer, Pawtucket, R. I., Fred W. Narb, Cairo, Nebr., and Francis Phillips, Anchorage, Alaska, who received $43,000, $35,000 and $20,000, respectively; D. E. Jackson Hospital, Lester, Ala., $20,000; Dr. James Ned Starnes, veterinarian, Central Point, Oreg., $9,000; Woodruff Community Hospital, Long Beach, Calif., $30,000. The October, 1958, Washington Report instructed all members interested in loans for capital improvements and equipment to contact the Small Business Administration, Washington 25, D. C.

U. S. Government Publications

Available by request from the Superintendent of Documents, Washington 25, D. C.

PHS No. 584-B7, 30 cents — National Health Survey on causes of hospitalization and length of confinement, forty pages including charts and tables.

PHS No. 584-B6, 35 cents — National Health Survey on the incidence of acute illness between July 1957 and June 1958. Forty-seven pages include information on time lost from work and school.

Also available are free single copies of the summary of national air pollution conference which was held here last November. Address the request to the Air Pollution Control Program, Bureau of State Services, Public Health Service, Washington 25, D. C.

Give me the money that has been spent in war and I will clothe every man, woman and child in an attire of which kings and queens would be proud. I will build a schoolhouse in every valley over the whole earth. I will crown every hillside with a place of worship consecrated to the gospel of peace.

Charles Sumner

INCOME TAX

HENRY KENT, C.P.A.
New York, N. Y.

TAXATION OF CAPITAL GAINS AND LOSSES

(Editor's Note: The author has requested that we do not publish his address, but he will personally answer letters received in the Journal offices regarding his series of papers on income taxes. "Taxation on Capital Gains and Losses" will appear next month.)

THE words "Capital Gain" weave a magic spell over most taxpayers. There is, of course, justification in the attraction to that unique feature in our tax law. The normal income tax which we poor taxpayers are subjected to ranges from 20% to 87% of taxable income while the Capital Gains Tax cannot exceed 25% of the profit realized in a Capital Gains Transaction and in most cases is way below that maximum rate. What are Capital Gains and how do we tax them? This article will endeavor in a brief question and answer form to cover the typical and most frequently encountered questions and problems of the average taxpayer.

1. Q. How is property for income tax purposes divided?
   A. Into two classes: a. Capital assets; b. Ordinary assets. (Note: A third classification Sec. 1231 assets is relatively unimportant for the purpose of this article and is omitted to avoid confusion.)
2. Q. What are Capital Assets?
   A. As a general rule investment property such as stocks, bonds, securities, investments into Real Estate, etc., and such non-business properties as your personal residence and your personal automobile, etc.
3. Q. What are ordinary assets?
   A. Generally speaking, inventory and all properties held for sale to customers or clients in the ordinary course of your business.
4. Q. How is the profit on the sale of ordinary assets taxed?
   A. At the same rate and manner as profits from sales, services, income from wages, etc., at the applicable income tax rates ranging from 20% to 87% of your taxable income.
5. Q. What about the taxation of profits from property classified as capital assets?
   A. That depends on how long you have owned the capital assets prior to the sale, or the holding period.
6. Q. How does the holding period affect the tax?
   A. The holding period of a capital asset is the most important factor in the realization of a favorable tax treatment of capital gains. Here we have two classes—namely, gains and losses from capital assets held for not more than six months are deemed to be short term and those held for more than six months are long term. Incidentally, the division of long term and short term does not, in any way, change the taxation of ordinary assets.
7. Q. How is the holding period of a capital asset computed?
   A. By excluding the day it was acquired but including the day it was sold.
8. Q. Do holidays and Sundays affect the holding period?
   A. No.

9. Q. On the stock brokers statements we usually have two dates, the trade date and the settlement date. Which date for holding period purposes governs?
   A. The trading date.
10. Q. What is a Capital Gain?
   A. The excess of the selling price over the basis (cost) of the asset sold.
11. Q. What is a Capital Loss?
   A. The excess of the basis (cost) of the asset over the amount realized, therefore, a loss.
12. Q. What is "basis" of a capital asset?
   A. Usually the total price you pay for acquiring a capital asset, which on the stock market includes brokerage fees and transfer taxes. The term "adjusted basis" is a rather complicated and sometimes important cost basis of an asset and concerns itself where property is received as gifts, inherited or in exchange for other properties or services, etc., and not within the scope of this brief discussion.
13. Q. How are Short Term Capital Gains taxed?
   A. There is no tax advantage in realizing Short Term Capital Gains—they are taxed at the same rates as other ordinary income.
14. Q. What about Long Term Capital Gains?
   A. Well, here is the magic. Gains on Capital Assets held for more than six months are taxed at a very favorable rate. The tax law permits you to pay tax on only 50% of the Long Term Capital Gain realized and the maximum rate on such a gain cannot exceed 25% on the total Long Term Capital Gain. If you are married and file a joint return, your net taxable income (after all deductions and exemptions) must exceed $36,000.00 ($18,000.00 if you are single) before you are required to pay the maximum capital gains tax rate of 25% on such Long Term Gains. If your taxable income is less than that, your effective Capital Gains Tax Rate will be below the maximum 25%.
15. Q. Can you give us an example?
   A. John Doe, married, buys 100 shares of X Corporation stocks for $15.00 per share or $1,500.00 plus $20.00 in stock brokers commission, a total cost (or basis) of $1,520 on February 5, 1958. On November 26, 1958, he sells the 100 shares of the X Corporation stock for $27.00 a share and realizes after stock transfer taxes and commissions $2,670.00. Since John Doe has held the X Corporation stock for more than six months, he realizes a long term capital gain of $1,150.00 ($2,670 less $1,520.00). If his net taxable income (after all deductions and exemptions) from his practice, etc., amounts to $12,000.00 and he files a joint return with his wife, John Doe will pay only 30% (his normal income tax on taxable income in excess of $12,000.00) on half of his long term capital gain (50% of $1,150.00) or 30% of $575.00. In other words, John Doe will only pay a 15% tax on the total long term capital gain of $1,150.00.
16. Q. What about capital losses?
   A. Here again the taxpayer must differentiate between long term and short term capital losses. Short term losses are offset against short term gains and long term losses against any long term gains. If the losses exceed the gains (regardless whether short or long term) the taxpayer may deduct up to $1,000.00 of such losses against his other

ordinary income. If the losses exceed the above limitation of $1,000.00, the unused portion can be carried over to the next five succeeding tax years and deducted in full against any future capital gains and $1,000.00 per year against ordinary income. Regardless of the nature of the capital loss in the year it arose, the carry over attains the character of a short term loss. This is commonly referred to as a capital loss carry over.

17. Q. Are Long Term Losses only computed as 50% of the loss similar to Long Term Gains?
    A. No. Long Term Losses are first applied in full against any long term gains and if they exceed such gains they are deducted in full subject to the limitations of capital losses discussed in Question 16.
18. Q. If my stocks appreciate in value and I do not sell them, do I have a capital gain?
    A. No. In order to have a capital gain, you must sell your stocks on which you have a profit. The same rule holds true for losses. The capital gain and loss provision only applies in the case of sale or exchange of property that are capital assets.
19. Q. I own a completely worthless stock that cannot be sold under any circumstances. Can I deduct the loss without a sale?
    A. Yes. If you can prove there is absolutely no market for your securities, you can deduct the loss as a capital loss as if the loss occurred in a sale on the last day of your taxable year. But you must deduct the loss only in the tax year that your securities became completely worthless, otherwise, you will lose the right of any deduction.
20. Q. What is a "Wash Sale"?
    A. Where a taxpayer sells stocks at a loss and within thirty days before or within thirty days after such a sale acquires substantially identical stock, the loss on such a sale is called a "Wash Sale" and is not deductible. This provision does not affect securities sold at a profit.
21. Q. Is the loss on a sale of a personal residence, a personal automobile or personal property deductible as a capital loss?
    A. No. Such losses are not deductible, however, gains may be taxable. On a personal residence, gains, if reinvested into another personal residence within one year of the sale, are not taxable.
22. Q. Where on the individual tax return are Capital Gains or Losses reported?
    A. On Schedule D, Form 1040. You cannot use Form 1040A.

In conclusion, it ought to be pointed out that the above discussion by necessity only covered the high spots of this rather long and sometimes even complicated subject.

CORRECTION

The 4th line, top left hand column, page 85, February issue should read, "Actual litigation or success is generally *not* a prerequisite to a deduction."

"No one expects miracles or sensational changes overnight."

José A. Mora, Sec'y-Gen'l
Organization of American States

PUBLIC EDUCATION INFORMATION

(Editor's Note: Periodically this section will provide information of assistance to the individual and to affiliated societies in the area of Public Education Information.)

VOCATIONAL EDUCATION

A very valuable contribution to public education can be frequently made through the Vocational Guidance and Education program. Of course, the real purpose of a vocational education program is to inform and interest young people about the great opportunity for service and the satisfactory professional life that can be theirs in the profession of podiatry-chiropody. In the course of informing these young people in groups, we will also have the opportunity of telling larger numbers of people of how we serve them.

At the national level, some formats devised for Vocational Guidance Educational Programs have been prepared and are being distributed at the state and local level. This has stimulated some very fine programs in some states. An increasingly large number of inquiries are received in our Washington office. During the past three months, the number of inquiries received and answered were more than double those for the same period a year earlier.

Please contact your state or local office first to assist you with your personal programs. The National Vocational Education Program will lose much of its effectiveness if not augmented by state, local and individual participation.

NATIONAL YOUTH FITNESS WEEK, 1959

A Proclamation by the President of the United States has designated May 3-9, 1959, as National Youth Fitness Week. President Eisenhower stated that, "The ongoing strength of our Nation depends upon the health of our young people and that we must always strive to improve the fitness of our youth by determined and coordinated efforts. Also, in this challenging world, it is essential that our young people recognize their obligation to themselves, to their families, and to the Nation, to endeavor to keep themselves mentally, emotionally, spiritually, socially and physically fit. I request officials of the Government, and I urge parents, young people and interested local and national organizations, to use all appropriate means during that week to promote programs and activities demonstrating the importance of youth fitness to the end that we may assure the continuing strength and well-being of our people."

All members are urged to actively support the objectives of the President's Council on Youth Fitness and participate in the planning and observance of National Youth Fitness Week in their community. The contribution of our profession to this vital public service will be gauged by YOUR cooperation and interest in the needs and requirements of YOUR community. Our Youth Fitness Committee will be anxious to learn of your interest and will cooperate with you in planning your program. Please contact the Chairman, Dr. John T. Sharp, 1424 Old York Road, Abington, Pa.

INTERPROFESSIONAL EDUCATION

The following are two of the many important facets which must be considered when developing improved relations between professions.

1. Personal: Those contacts, professional, civic and social, which concern the individual practitioner, such as hospital or institutional affiliation, foot health examinations of school children, municipal and service club health committees and speaking engagements. These activities must represent the best attributes of the individual and the highest standards of our profession,

although they are frequently not undertaken as an official representative.

2. Organizational: Programs planned and directed at the national, state or local level, such as interprofessional councils and conferences, federal and state health programs, participation in prepaid health plans, liaison with allied health associations, federal and state legislative activities, professional conventions and meetings. Certain programs are prepared at the national level and suggestions are made to the state offices. Contacts are maintained and improved with national organizations to establish a favorable climate and so that the activities of the state societies can be coordinated.

Many requests for information have been received by our Washington office and the Chairman of the Medical Relations Committee, Dr. Raymond K. Locke. Samples of all the pertinent publications and detailed information on all the Audio-Visual and other materials have been supplied to state offices. Audio-Visual exhibits can be obtained through state offices. Printed materials are available to the individual members in limited quantities (see below). These will enable every member to be a better informed, personal representative of his profession.

EDUCATION AND INFORMATION MATERIALS

Your national office has a limited number of reports, pamphlets and leaflets that contain much information to help you in your personal and organizational information and education programs. A list of these is published below. Prices quoted for single pamphlets are only for handling and postage costs and a minimum charge of 25 cents must be made. Prices quoted for quantity lots are possible only because of subsidization of part of the costs from national appropriations.

Audio-Visual exhibits should be ordered through state or local organizations and directly from the Audio-Visual Committee, Dr. Marvin Shapiro, Chairman, 1059 Spitzer Building, Toledo, Ohio.

This list covers materials only for Interprofessional and Vocational Guidance Education Programs.

1. Report of the Judicial Council—To the Members of the House of Delegates of the American Medical Association. (Report of Officers) 5 cents
2. Interprofessional Relations by S. M. Poindexter, M.D., F.A.C.P., Twin Falls, Idaho 5 cents
3. Podiatry and Public Health by Daniel Leo Finucane, M.D., Washington, D.C. 5 cents
4. The Human Foot by J. H. MacDermot, M.D., C.M., Vancouver, B. C., Canada 5 cents
*5. The Chiropody Clinic in Hospital Routine by Albert Pincus, D.S.C., Richmond, Virginia 10 cents
6. Dermatology and the Chiropodist by Reuben Friedman, M.D., Philadelphia, Pa., read before the Medical Society of Delaware, Rehoboth, Sept. 9, 1952. 5 cents
7. The Chiropodist and the Community by William J. Stickel, D.S.C. 5 cents
*8. The Role of Chiropody in Hospital Services by Isadore P. Forman, D.S.C. 5 cents
9. Our Public Responsibility to Hospitals and Prepaid Health Plans free
10. What May a Podiatrist-Chiropodist Do? free
11. The Prevalence of Foot Disorders in the United States 5 cents

(THE ABOVE CHARGES ARE TO COVER MAILING AND HANDLING COSTS AND DO NOT COVER THE COST OF PRODUCING THE MATERIAL.)

12. If you're planning a professional career . . . 1,000 copies—$15.00
500 copies— 8.00
100 copies— 1.75
13. Stepping Up to a Career (N.A.C. Imprinted)
1,000 copies— 8.00
100 copies— 1.75
14. Hospital Service Information Kit (Included in this kit are some of the above pamphlets (*) plus additional mimeographed information on hospital services by podiatrists-chiropodists.) 35 cents
15. The Chiropody-Podiatry Clinic in Hospital Routine. (A verbatim narration of the below-mentioned film.) 10 cents
16. **Medical-Hospital Relations Film:** The Chiropody-Podiatry Clinic in Hospital Routine. 16mm full color and sound film, running 22 minutes. Portrays the role of the podiatrist-chiropodist in the hospital service. The film illustrates how the Podiatry clinic operates in a Class A hospital and demonstrates by means of a group of typical cases the value of this service.
Produced and directed by Raymond K. Locke, D.S.C., F.A.S.C.R., and introduced by George M. Knowles, M.D., D.A., B.I.M., F.A.C.P., Associate Director of Medicine of Hackensack Hospital, Hackensack, N. J.
17. **Medical and Hospital Exhibit.** This exhibit is designed to inform the physician as to our educational background, our present service in Hospitals and Clinics and how the podiatrist-chiropodist may serve his patients.
18. **Cyclopedia of 1,000 Clinical Entities of Common Foot Disorders Exhibit.** Marvin W. Shapiro, D.S.C., Toledo, Ohio. A comprehensive collection of nearly every type of acquired common foot disorder in this exhibition of colored slides taken from clinical surveys of 25 years' experience in podiatric service with and for the physician.
(SPECIAL INSTRUCTIONS ON ALL EXHIBITS: Advance notice is required—name of meeting and exact dates exhibit is to be used—all exhibits are shipped Railway Express, *Collect,* and must be returned, Railway Express, *Prepaid,* Insured—to: Audio-Visual Council, 1054-59 Spitzer Building, Toledo, Ohio.)
An Audio-Visual Catalog will be available about April 15, 1959 at 35 cents per copy. In addition to the above-mentioned exhibits, the catalog will have among other items a listing of colored slides of more than 1,000 titles.
19. **Army Podiatry Clinic Exhibit.** Vividly illustrates by means of giant colored transparencies and by continuous automatic projection the Podiatry Service in the U. S. Army Medical practice. Describes how the podiatrist-chiropodist provides the ancillary service to the Army Medical Team.

(Requests for the above exhibition should be initiated on State Society stationery. Address the Surgeon General of the Army, Main Navy Building, Washington 25, D. C.)

"Science is an utter surrender of what we wish to believe to be a recognition of the actual fact.

DIGESTS FROM THE LITERATURE

Anyone wishing to read the complete article, if not available in your local library, may borrow it through interlibrary loan. A microfilm may be borrowed from the National Medical Library, Washington 25, D. C., or a photo-duplication may be obtained from that library.

MUSCULOSKELETAL

Deformities Can Be Prevented, F. E. Dugdale. Delaware M. J. 29: 58-61, 1957.

Disabilities of the hemiplegic patient include "frozen shoulder" and flexion contractures of the upper extremity and can be prevented by ten minute daily attention. During the shock the patient should be placed in a comfortable position and the arms exercised. The affected lower extremity is first braced by a small pillow on the lateral side beneath the greater trochanter to prevent external rotation of the foot and leg and then three or four times a day the thigh is flexed on the abdomen and the knee flexed on the thigh six or eight times to maintain joint motion. Prolonged bed rest is not advocated; as soon as the acute shock is over, active treatment and ambulation should begin. Protein metabolism and calcium and phosphorous balance should be maintained to prevent muscular wasting, formation of urine calculi, and osteoporosis.

Deformity of the arthritic patient due to flexion contractures can be prevented. Continued placing of a pillow beneath the knees to lessen pain can cause knee flexion deformities, shortened hip flexors and combined knee-hip flexion contractions, thus making walking impossible. A patient with a combination of poor positioning, muscular weakness and atrophy requires long-term physical restorative procedures, and even then the end results may not be satisfactory. Simple preventive measures include sleeping supine with a board beneath the mattress, proper alignment of the joints during the acute stage, the upper and lower extremities aided by half-shell, padded plaster splints, which are removed three or four times daily, and all joints put through a full range of motion within limits of pain; use of an analgesic may be necessary. Muscle setting is done hourly if the patient is awake, to prevent muscle weakness and atrophy, and to improve circulation in the limb. When not being exercised the lower extremities should be kept in extension. A pillow against the footboard of the bed gives the foot added support. Most deformities of the lower extremities are due to extensor weakness. Thus, proper positioning of the body and maintenance of joint range of motion are basic principles in treatment. Crippling disability should always be anticipated in the aged, and prevented.

Management of Hallux Valgus, J. M. Goodman. Med. Times 85: 143-48, 1957.

When this defect is first apparent, its progress may be arrested and the distortion corrected by use of proper footwear and padding. Advanced cases should receive surgical treatment to correct the extreme adduction of the great toe's proximal phalanx by the adductor hallucis and lateral head of the flexor hallucis brevis. The bony excrescence on the medial head of the first metatarsal and its bursa should be removed, followed by proper alignment and fixation of the first proximal phalanx with the first metatarsal bone. Various operations are described: the Silver, Mayo, Peabody, Kleinberg, and McBride procedures. A combined McBride and Silver operation

is recommended as a simple method which allows early postoperative ambulation and brings good results.

A three-inch-long curvilinear incision with its distal end over the medial portion of the joint provides good exposure by retraction. After identification and isolation of the common tendon of the first head of the flexor hallucis brevis and oblique and transverse heads of the abductor hallucis, they are transfixed with a heavy chromic catgut suture and then severed close to the base of the phalanx with a knife. If the sesamoid is displaced, a curved toothed hemostat is used to mobilize it and maintain traction on it while separating it from its attachments. Then transversely incising the capsule from lateral to medial side and disarticulating the toe plantarward at the metasophalangeal joint, the extensor hallucis longus is pulled laterally to expose the osteophytic prominence on the medial part of the metatarsal head. After chiseling it off and smoothing the base with a rasp, the toe is articulated and the bursa then excised beneath the skin. With the toe now aligned, the medial portion of the thickened capsule is imbricated with mattress sutures of chromic catgut over the joint's medial portion, and the conjoined adductor hallucis tendon sutured to the dorsolateral aspect of the first metatarsal head; the subcutaneous tissue and skin are then closed. Adhesive tape and a pad between the great toe and the second toe in a figure of eight secure the alignment. A 2-inch pressure bandage is applied over the foot, and ice bags applied for eight hours; the foot is kept elevated for 24 hours. Ambulation begins on the first postoperative day, using a cut-out shoe on the second day. Skin sutures are removed on the seventh day and the wound covered with collodion. The adhesive traction is maintained until the toe retains its position without this aid.

Clinical Evaluation of Tendon Transplantation in the Paralytic Foot, L. R. Staub, J. P. Harvey, Jr. and C. E. Fuerst. J. Bone & Joint Surg. 39-A: 1-16, 1957.

Follow-up examinations of 214 tendon transplantations, done singly or in combination, in 181 feet are clinically reviewed. The different methods of tendon insertion used were: (1) intra-osseous suture or implantation of the tendon into a bed or channel of bone with suture of the tendon to bone or to periosteum; (2) the loop method—passage of the tendon end through an osseous tunnel and back to be sutured to itself; (3) Bunnell's method—use of a pull-out wire passed through a hole in the bone of insertion, with the wire tied over a button on the sole of the foot; or the wire pull-out was eliminated and a chronic catgut suture used (this was less secure). The results of these methods were almost equally good. A chief cause of failure in tendon transfer lies in inadequate tension.

Transfer of the extensor longus into the neck of the first metatarsal with or without fusion of the proximal interphalangeal joint of the great toe (Jones operation) was performed in 75 feet. Arthrodesis of the interphalangeal joint of the great toe done in 68 of these feet proved satisfactory in 52. The most difficult feet to treat were those with severe deformity or marked instability. In 18 of such feet triple arthrodesis was done with satisfactory results in 14. In 46 patients the extensor hallucis longus was transplanted without any other tendon transfer. In some patients the peroneus longus was transferred at the time of the Jones operation, and in others the peroneus brevis; in a few both of these were transplanted in combination with the extensor hallucis longus. The extensor hallucis longus tendon transfers proved functional in about 50 per cent of cases. Transplantations for valgus deformity resulting from poliomyelitis were performed, 6 for cal-

caneovalgus and 34 for equinovalgus, with much better results than attained with tendon-transfer fusion. It was concluded that the two most important factors in correction of valgus deformity are triple arthrodesis to provide stability and improvement in tendon function, and the removal of deforming peroneal power in the unbalanced foot. Most varus deformities were treated by triple arthrodesis alone. Transfer of tibialis posterior tendons through the interosseous space, done in a few cases, was disappointing. Transfer of the tibialis anterior tendon led to hyperextension; cock-up of the great toe occurred in two patients.

Stabilization was an important factor in correction of calcaneous deformity following poliomyelitis. Combined triple arthrodesis with transplantation to the heel cord of any strong muscle group proved worthwhile, particularly if done early before a severe calcaneous deformity developed. Correction of clubfoot in 17 patients proved successful in 16; the tendon was transplanted to the cuboid, the third cuneiform, the fifth metatarsal, or to the second cuneiform. Although cock-up deformity occurred in 1.2 per cent of these cases it was not severe enough to require a Jones procedure. In many cases of transfer, failure was believed due to tendon laxity at operation, or to the pulling out of the tendon attachment postoperatively. Although the intra-osseous suture is not a particularly strong suture method, it gave excellent results in operations for clubfoot.

NERVOUS SYSTEM

Pain in the Lower Limb after Sympathectomy, G. D. Tracy and F. B. Cockett. Lancet 1: 12-14, 1957.

Lumbar sympathectomy has proved beneficial in cases of spastic disorder, through reduction of vasomotor tone which leads to increased blood flow to the skin and foot in cases of decreased response to injurious environmental factors such as cold, and to elimination of excessive sweating of the foot; and has brought improvement in cases of intractable causalgia. Over a 12-month period, 51 lumbar sympathectomies were performed on 42 patients. Following operation pain occurred in 9 extremities of 7 patients, the pain usually developing on the tenth to the seventeenth day after operation. It was severe, with sudden onset, worse at night, and always occurred in the anterior part of the thigh extending down to the knee. Hyperesthesia to light touch was present in all patients, but with no evidence of somatic nerve damage. Spontaneous recovery occurred in all but one patient who finally obtained relief after 5½ months.

Apparently the syndrome is peculiar to this operation; it is not observed after other operations in which somatic nerves have been injured. The pain is distributed to the front of the thigh in the first two lumbar dermatomes; residual sympathetic activity is always found in this area following a lumbar sympathectomy, possibly due to the presence of accessory sympathetic ganglia in the anterior roots of L1 mainly, but also in T12 and L2. A greatly increased sympathetic activity in this area when it is the site of pain was demonstrated in this study.

Traumatic Neuromata of the Digital Nerves, S. D. Simon and C. M. Silver. Rhode Island M. J. 40: 87-90, 1957.

Neuromata, which are not true neoplasms but nerve elements trapped in granulation tissue, usually have a history of trauma involvement of one or more peripheral nerves—often from a crushing injury to the digits. In some cases chronic pain leads to morphine addiction. Injection of absolute alcohol and of sclerosing agents, such as formalin, produces formation of scar tissue around the nerve stump. A technique used in treatment of 70 cases

of neuromata was successful in all but 2 patients, one man with a crushing injury to the thumb and a woman with crushing of the index finger. In such cases it is suggested that a pain pathway has developed involving the crushed cortex.

The method used was use of general anesthesia, then dissecting out the end of the nerve and its neuroma, and retraction of the surrounding tissue upward. After the nerve is sectioned as far proximally as possible and retracted away from the operative site, the distal nerve stump and scar tissue are removed, and the wound closed with silk sutures and a compress dressing applied. A follow-up six months later has found the patient in his former occupation in almost every instance. Thus when digital nerve ends are freed and sectioned under tension, scar formation and fibrosis of soft tissue do not occur.

NEW GROWTHS

Solitary Cyst of the Os Calcis in Adults and Children, L. B. Kingsbery. J. Internat. J. Surgeons 27: 83-91, 1957.

This bone lesion is usually detected only when x-rays are taken of other disorders of the ankle and foot, though occasionally pain on weight bearing and tenderness may cause suspicion of the presence of a cyst. Eight cases are reported, five of them in children. Few of these patients had symptoms. The cause of the cyst remains unknown, but congenital or traumatic factors are suggested. Fractures into these solitary cysts have not been reported, although pathologic fractures are possible. Chemical studies in these cases gave normal results. Treatment in a 16-year-old boy consisted of application of a long leg plaster cast because of the possibility of fracture. In the other children shoe correction, application of a cast, or treatment for ankle sprain sufficed without any treatment of the cyst itself. Surgical intervention was done in two men and in one other man successful treatment consisted of protection of the ankle, although repeated trauma to the foot and ankle occurred. If surgery is performed on an adult, the cystic wall should be thoroughly curetted and the bony cavity packed with cancellous bone chips.

PHYSICAL MEDICINE

Treatment of Paralysis with Exponentially Progressive Currents, H. Thom. Brit. J. Phys. Med. 20: 49-56, 1957.

The objective of treatment of paralysis is restoration of active mobility. Active movement exercises are the basis of therapy and must be carried out by the patient himself. Full use can be restored to muscles which are only slightly or temporarily damaged, but those severely damaged require certain aids in order to produce optimum conditions for such exercises, for example, exercises in swimming pools or special baths, and use of equipment designed to aid weak muscles. In severe poliomyelitis cases the patient is unable to use certain muscles at all, but even badly damaged muscles can be restored to normal function by use of active movement therapy if the synergistic muscles are damaged little or not at all. The tasks of electrotherapy are to exercise, strengthen, and restore proper functioning of all muscles remaining after disease or trauma, and to prevent if possible progressive atrophy and fibrosis of degenerated muscle until normal function is resumed through regeneration of nerves spontaneously or following neurorrhaphy or neurolysis. Modern electrotherapy affords selective excitation of damaged muscle tissue without affecting the surrounding healthy muscle. Selection of suitable types is described according to impulse duration, impulse gradient, and pause duration, in treatment of partially or completely paralyzed muscle and normally innervated muscle with slight atrophy. Application of the new bipolar electrode technique is de-

scribed. Two dangers can threaten the poliomyelitis patient—inadequate treatment, and exaggerated treatment which puts stress upon his system beyond his physical and mental endurance. Psychologic guidance is important since improvement is slow and wearisome and restoration depends upon the patience of the doctor, therapist and patient; the patient must be continually incited to energetic and determined cooperation.

RHEUMATIC DISEASES

X-Ray Changes of Diagnostic Importance in the Commoner Types of Arthritis, J. L. Sosman. Bull. Rheum. Dis. 7: Supp. April 1957.

Roentgenologic findings in infectious arthritis indicate effusion in joint capsules, demineralization spreading out from the affected joint, loss of detail in the articular cortex, destruction of cartilage which progressively narrows the joint space, and new bone formation in a severely damaged joint heralding ankylosis. In rheumatoid arthritis x-rays may show inflammatory changes becoming proliferic and occasionally atrophy; soft tissue swelling with various degrees of osteoporosis, with subarticular mineralization which spares the articular cortex, and a generalized loss of bone density. Joint swelling following joint effusion is seen regularly in the knee. Over a period of months or years bone erosion appears mostly at the margins of the articular cortices, the degree varying in the several joints, and is progressive. Cystic changes in bone may be recognized. Though erosion and ankylosis may not occur, soft tissue changes may cause severe subluxation and dislocation. If the activity of the disease ceases, bone density returns somewhat and no further deformity occurs; but any deformity present remains. New bone formation and hypertrophic changes may follow.

Similar x-ray findings are observed in psoriatic arthritis. Juvenile rheumatoid arthritis, however, shows more marked soft tissue swelling and greater effusion and larger amounts of intracapsular fluid in most joints. Demineralization occurs, offset partly by development of the epiphyses, but with deformity of the epiphyses. Usually there is a spine involvement and an outstanding characteristic is acceleration of epiphyseal maturation without growth. X-ray examination in cases of gout shows a tophaceous appearance which is unmistakable, with sharply punched-out areas of bone at the articular margins and tophi in the neighboring tissues. Some pre-tophaceous gout x-rays show comparatively negative results. Diagonsis of gout is clinical rather than radiologic. X-ray study of osteoarthritis may show hypertropic stigmata or be symptomless. The earliest changes seen are exostoses of bone adjacent to the joint, narrowing of the joint space, slight thickening and intensification of the articular cortex, loss of subarticular trabecular detail, subarticular sclerosis and sharpening of marginal angles of the joint surface. This is followed by cartilage erosion, tiny spurs, and slight changes in shape and granular irregularity of the articular cortex. Later, loose bodies result from separation of spurs; joint space disappears, and eburation and reshaping of bone ends are noted. The neuropathic joint and the hemophiliac joint are types of secondary osteoarthritis.

Differential x-ray diagnosis in these diseases is unsatisfactory unless clinical information is made available to the roentgenologist.

Smart people may speak from experience . . . smarter people, from experience, don't speak.

ORGANIZATION NEWS

Secretaries of local, state, regional, affiliated, subsidiary and other related organizations are invited to submit copy for these columns.

ILLINOIS

George V. Byfield, M.D., Assistant in Clinical Medicine, Illinois College of Medicine, addressed the Illinois Chiropody Society at its February 18 meeting on "Heart Disease as Related to the Lower Extremities." Mr. Wayland Sears, Clinical Research Associate, E. R. Squibb & Sons, spoke on "What Squibb is Doing for Foot Care." Peter N. Varzos, D.S.C., Chairman of the I.C.S. Committee on Public Information, will address the March 12 meeting of the Occupational Health Nursing Section of the Illinois State Nurses' Association on "Value of Professional Foot Care." Dr. Jack Collins, Columbus, Ohio, will speak before Zone III of the I.C.S., March 8, on "Practice Revitalization."

Posters and Pamphlets on Occupational Foot Health

The Sub-Committee on Foot Health Literature of the Illinois Chiropody Society has now available a poster and pamphlet designed for use in industrial plants. Some are being distributed through the division of industrial nursing of the state department of public health.

A poster and pamphlet were mailed to all presidents and secretaries of other state groups.

"Looking Up to Your Feet" is the title of an article appearing in "What's New in Industrial Nursing," published by the Illinois State Department of Public Health, Nov.-Dec. 1958, by Dr. Peter N. Varzos, Chairman of the Committee on Public Information.

Angelo P. Creticos, M.D., has been appointed to the staff of the Illinois College of Chiropody to teach peripheral vascular disease.

Awards for Research Papers

The Wm. J. Stickel Annual Awards
for Research in Chiropody (Podiatry) for 1959

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See Page A28 for Rules and Pertinent Information

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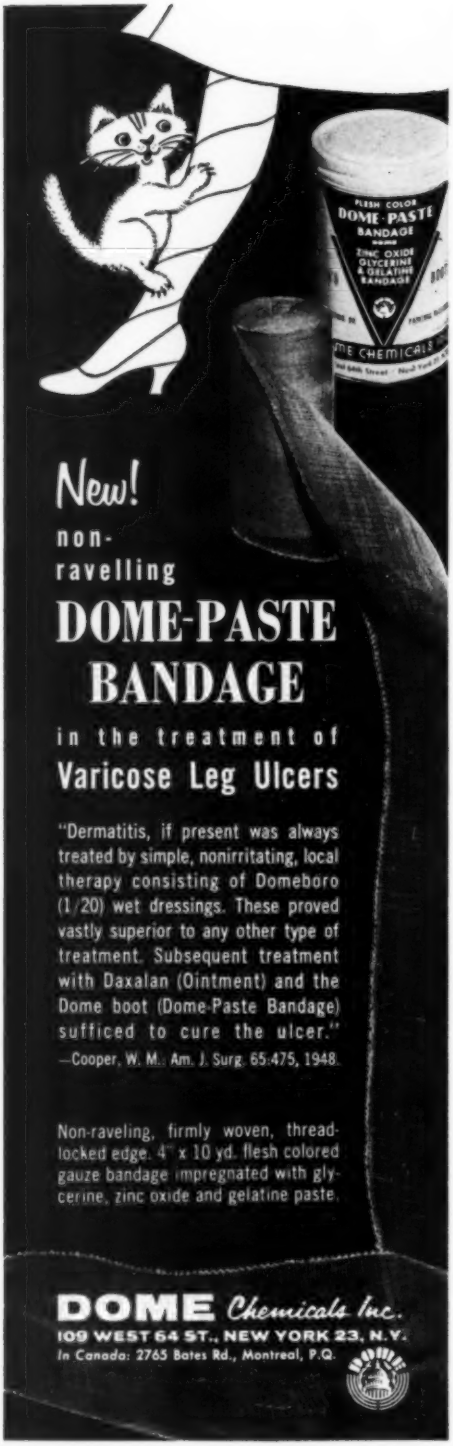
1st Award - $200.00 — 2nd Award - $150.00 — 3rd Award - $100.00

Application forms, rules and regulations can be obtained from the Secretary. The final date on which papers will be accepted is May 1, 1959.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—Cooper, W. M., Am. J. Surg. 65:475, 1948.
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NORTH CAROLINA

The Mid-Winter Scientific Conclave of the North Carolina Chiropody Association was held at Southern Pines, North Carolina, January 24th and 25th, 1959. Dr. Harry W. Lindy of Detroit, Michigan, spoke on "Medical Relaxation, Suggestive Therapeutics, Psychosomatic Medicine and Hypnosis" as it pertains to the practice of our profession.

The annual business meeting will be held in Charlotte, North Carolina, June 1959.

OKLAHOMA

Dr. Ralph Owens was awarded the "Service to Mankind Award" on January 27, 1959, by the Oklahoma Sertoma Clubs. The award was presented by Lieutenant Governor George Nigh. Dr. Owens was honored for his unselfish efforts in his church, Lions Club, Oklahoma City, educational department, YMCA and other youth work, as well as his leadership in the American College of Foot Surgeons.

January, 1959, Dr. Eugene Gardner of Midwest City was chosen "Kiwanian of the Year." Dr. Gardner has been active in youth work of all kinds. He has served on the Board of Directors of the YMCA, and it was through his efforts that the Kiwanians "Little Olympics," a Kiwanis sports event for grade school students, was organized in Midwest City.

PENNSYLVANIA

Philadelphia Chiropody Society

The Philadelphia Chiropody Society was host to the North Philadelphia Chiropody Society for the annual Reuben Friedman Memorial meeting on January 20, 1959, at the Philadelphia County Medical Building. Scientific speaker was Leslie Nicholas, M.D., who lectured on "Psychosomatic Dermatoses of the Lower Extremities."

South Central Division

The January meeting of the South Central Division was held January 27 at the Penn Harris Hotel in Harrisburg, Pennsylvania. The York, Pa., delegation presented a scientific symposium. Dr. Jeffrey spoke

on "Morton's Neuralgia"; Dr. Concino on "Cryptic Nail Disorders" and Dr. Hagen on "Calcaneal Exostoses."

Dr. Jack Pincus presided at the meeting.

TEXAS CHIROPODY FORMULARY BEING MADE AVAILABLE TO ALL STATE SOCIETIES

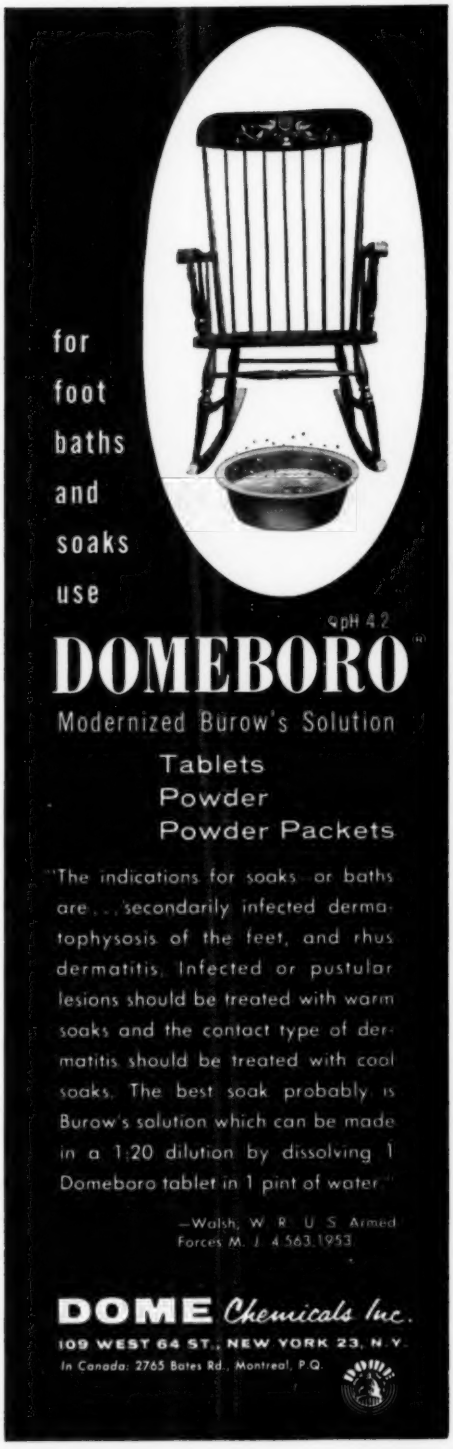
The Texas Pharmaceutical Association has agreed to reprint the Chiropody Formula, edited by Dr. Ralph E. Owens of Oklahoma. Revision is being made by a committee of Texas chiropodists and pharmacists. Dr. Owens will work with the committee consisting of Drs. A. V. Johnson and Joseph R. Ordile of the Texas Chiropody Society and, representing pharmacy, Dr. Frank P. Cosgrove of the University of Texas College of Pharmacy, Dr. Homer Lawrence, University of Houston College of Pharmacy, Ben Harper and G. B. Park.

All chiropodists in Texas will receive copies through the courtesy of the Texas Pharmaceutical Association. It is their intention in publishing the formulary to have it so fashioned that other state pharmaceutical or podiatry-chiropody societies may arrange to have copies printed for their states by merely changing the cover sheet. It will be a loose-leaf publication, simplifying keeping it current.

State societies wishing to arrange for copies for members should communicate immediately with Mr. C. J. M. Roesch, Executive Secretary, The Texas Pharmaceutical Association, Austin Savings Building, Austin, Texas, as they go to press in May.

M. J. LEWI COLLEGE OF PODIATRY

The M. J. Lewi College of Podiatry, in conjunction with the Podiatry Society of the State of New York, is offering a postgraduate course in foot surgery. The course will cover office and hospital asepsis medication for pre- and post-operative management, nerve block, anesthesia, cadaver surgery and surgical demonstrations. Courses will begin in March 1959.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—Walsh, W. R. U. S. Armed Forces M. J. 4:563,1953
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CHICAGO COLLEGE OF CHIROPODY

The Chicago College of Chiropody will hold a special session of instruction for chiropodists' nurses, assistants and receptionists.

Topics covered by members of the faculty and other experts will be, An Introduction to Medical Terminology; The Chiropodist's Assistant; Antisepsis; Dressings and Bandages; Your Telephone Voice; Syringes and Injections; History of Medicine; X-Ray and Dark Room Technique; The Use of Physical Therapy and Charm Course.

PLEASE PARDON US. In the January Deaths Reported section, the death of Harold Topol was erroneously reported. The death of his father, Jerome Topol, should have been reported.

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DEATHS REPORTED

Elizabeth Sealy Austin
Birmingham, Alabama

E. M. Mayne
Philadelphia, Pa.

Eugene C. Rice
Silver Spring, Md.

Dr. Rice, one of the few M.D.'s who practiced podiatry exclusively, died at the age of 91 of coronary thrombosis, on February 10 at his home. Dr. Rice was a practicing podiatrist for 60 years and a leader in the development of podiatry. He was a member of the District of Columbia Podiatry Society and the American Podiatry Association. In August 1949, he became an Honorary Member.

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Julius Rothschild, Long Island City, N. Y.
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HOSPITAL SERVICE NEWS

OKLAHOMA

Dr. Howard Johnson, Enid Chiropodist, was elected Secretary-Treasurer of the Board of Directors of the Enid Memorial Hospital for 1959 at the annual meeting of the Board, February 3, 1959.

Enid Memorial Hospital was built 32 months ago at a cost of more than $300,000. Dr. Johnson has served as Secretary-Treasurer of the active medical staff the past two years.

PENNSYLVANIA

More than eighty podiatrists from Philadelphia and South Jersey attended, on January 25, 1959, the second seminar presented by the Department of Podiatry of St. Luke's. Dr. Jay H. Davidson, M.D., Clinical Instructor at the Graduate School of Medicine of The University of Pennsylvania, discussed the "Lower Extremity and Edema." Dr. Paul K. Perilstein, M.D., Instructor of Internal Medicine at Jefferson Medical College, discussed the "Etiology, Pathology, Physiology and Treatment of Thrombophlebitis of the Lower Extremity."

COMMUNICATIONS FROM THE PROFESSION

To the Editor:

Wall Street and the Stock Market are well known as a place where financial gains or losses will be shown in direct proportion to the purchase price of securities. As a rule, when stocks are over-priced, the demand to buy is low, but when they are in a reasonable ratio to their earning capacity, the demand is increased.

It is the opinion of many men, with whom the writer has spoken, that an analogy exists between sound business tactics and the dearth of students in the various schools of chiropody. This can very well be likened to the stock market. The purchase price of a chiropody-podiatry educa-

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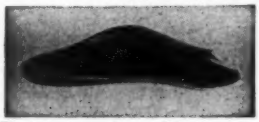

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tion in time and money is just too high for the anticipated remuneration after graduation.

One does not have to be overly bright to realize something must be seriously amiss when almost every college in the nation is bursting at the seams with students and prospective students while colleges of chiropody-podiatry are in an extremely precarious position. As much as the profession may not like, or want to admit it, the fact remains that with the ever-increasing academic requirements, the student bodies of chiropody-podiatry schools have decreased in direct proportion.

It is not the purpose of this letter to suggest the return of the two or three year classes, but the situation must be realistically faced. Two years of Liberal Arts college, four years of chiropody-podiatry college, and a year of so-called "internship" is pricing the profession out of business. Any student who compares these requirements to those of medicine must indeed be dedicated to choose chiropody-podiatry. Chiropody-podiatry likes to pat itself on the back for the strides it has made in the past twenty-five years and justly so, but many members secretly covet that M.D. degree with all its privileges, prestige, and financial advantages. These too then must be the same thoughts which go through the mind of an intelligent student at the end of two years of college. So far as he is concerned it is only an additional two years to invest to be the holder of an unlimited license. This is a sound business approach and chiropody-podiatry has nothing to refute such reasoning.

It is still not too late to take the necessary steps to save the profession from oblivion, but time is running out and running out fast. The first thing which should be abolished is the farce known as "internship." This period of time has the most ambiguous value of any time spent in school. Whatever is learned in that extra year could have been learned during the regular four year course. Furthermore, internship places the student under a hardship which

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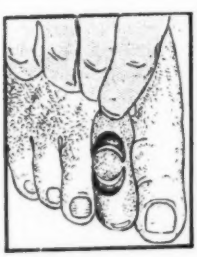

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offers him nothing in return which could not have been received without it. If this so-called internship were served in an accredited regular hospital it could be an entirely different story, but under present conditions it is a millstone around the neck of the student and the profession. Chiropody-podiatry students spend four years in didactic instruction whereas medical students put in about two and one-half to three years in classroom work. The senior year of medicine is almost all hospital service. Where, then, does chiropody-podiatry come in to demand more?

Let the profession adopt the slogan "Whither Chiropody-Podiatry" and do something about it, lest it becomes "Wither Chiropody-Podiatry" caused by a few well-meaning but extremely short-sighted people.

Oscar M. Scheimer, D.S.C., F.A.S.C.R.
Westwood, New Jersey

WOMEN'S AUXILIARY MESSAGE

Let us for a few moments stop and consider the "Balance" in our daily living. Are we, like the children's seesaw, sometimes up and sometimes down? Too often in this present day when things are going at such a fast pace, we have no time for some of the really important things of life.

With the increase in our knowledge and ability we all too often lose our humaneness and heart. People cease to be living human beings, but merely a means to an end. And where does that end lead? It has been said that "No man has a right to leave the world as he found it. He must add something to it; either he must make its people better or happier, or he must make the face of the world more beautiful or fairer to look at."

We are all too used to bigness and thinking big in most aspects of our daily lives. Because of this we all too often overlook the smaller, more important things. We should remember that lives are made to serve with not just to live with. Perhaps

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now is the time to realize the ideal of success should be replaced with the ideal of service.

Following are four rules taken from an editorial in the Optimeter which I think might be helpful to everyone.

"To think clearly. Not to let our passions and our prejudices cloud our thinking. Not to let our ambitions and our hopes blind our thinking. Not to let incomplete information confuse our thinking. Not to let the mistakes of the past weaken our thinking. Not to let the unknown in the future frighten our thinking.

To act honestly. To recognize clearly the difference between right and wrong. To do the right thing because it is right and to avoid the wrong thing because it is wrong. To resist those temptations to twist the truth for dishonest purposes, and to go ahead always and do what our sense of honesty tells us we ought to do.

To have a high regard for other people. To believe in all sincerity that most people are fundamentally good. To look for the best in all people and to treat everyone as if we had a sincere love for them—using love in the sense it has in the idealism of religious faith.

To trust in God. To believe that there is a Supreme Being that watches over this world. To believe in the broad sense that man is under His care and guidance, that as long as we do our part we can trust Him to give us the help we need to meet the problems that are beyond our own strength.

If we do think clearly, if we do act from honest motives, if we do have the right attitude toward our fellow man, and if we do trust in God, then our lives will have that meaning which makes the trials and tribulations of everyday living worthwhile. And when life is worthwhile, it engenders a measure of contentment and happiness which can be found in no other way."

If each of us will follow these few simple rules in our daily living, surely our "Balance" will be easier to maintain.

No man grows except as he reaches up and out.

Thelma Cooper, R.N., *President*

POST — TREATMENT

value of the Patient Education Pamphlet

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The only dispensing service available with educational and promotional impact for increased referrals to your practice. The prescription directions are filled in by the Chiropodist or Podiatrist on the pamphlet.

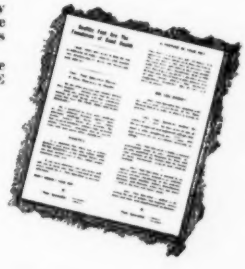
The Patient Education Pamphlet emphasizes that the FOOT SPECIALIST is one of the guardians of public health, and shares this responsibility with the physician and dentist. It details the scope of the treatment performed by the Foot Specialist. The background, schooling and training of the Foot Specialist is subtly explained to the patient in detail. This explanation inspires confidence and trust.

The necessity of chiropodical treatment for diabetics is emphasized by the Patient Education Pamphlet. The specialized medicine for diabetic patients is part of Chiropody Prescriptions' formulas and is available along with the pamphlet.

The pamphlet shows the value and necessity of foot care for children, and parents are urged to see a Foot Specialist for the welfare of their child. The Patient Education Pamphlet gives facts concerning the possibility of unsuspected foot disorders amongst children.

A Patient Education Pamphlet distributed with a Chiropody Prescription highlights the sincerity and personal consideration the FOOT SPECIALIST has for his patient.

Now, to complete your service to patients WRITE for FREE literature.



CHIROPODY PRESCRIPTIONS

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CONVENTION DATES AND MEETING NOTICES

American Podiatry Association
New York, N. Y., August 27-Sept. 1, 1959
Waldorf-Astoria Hotel
Michael I. O'Connor, Exhibit Manager
428 E. Preston St., Baltimore 2, Md.

Region One
(Conn., Maine, Mass., N. H., R. I., Vt.)
Boston, Mass., Sept. 25-27, 1959
Sheraton Plaza Hotel
Dr. Francis B. Powers
19 Dale Ave., Gloucester, Mass.

Region Two
(New York)
Mr. Gilbert Hollander, Ex. Sec.
353 W. 57th St., New York, N. Y.

Region Three
(Del., Md., N. J., Pa.)
Atlantic City, N. J., May 7-10, 1959
Ambassador Hotel
Dr. B. C. Egerter, Gen. Chairman
507 Liberty Ave., Pittsburgh, Pa.

Region Four
(Ohio)
Columbus, Ohio, May 21-23, 1959
Deshler-Hilton Hotel
J. Edwin Farmer, Ex. Sec.
Fifty W. Broad St., Columbus, Ohio

Region Five
(Ill., Ind., Mich., Wis.)
Chicago, Ill., March 20-22, 1959
Morrison Hotel
Dr. Earl G. Kaplan
14608 Gratiot Ave., Detroit 5, Mich.

Region Six
(Colo. Iowa, Kan., Minn., Mo., Nebr., N. Dak., S. Dak.)
Kansas City, Kans., April 10-12, 1959
Town House Hotel
Dr. Reid L. Cox, Gen. Chairman
409 Huron Bldg., Kansas City, Kansas

Region Seven
(Idaho, Mont., Oreg., Wash., Wyo.)
Vancouver, B. C., April 24-26, 1959
Hotel Georgia
Norm Matthews, D.S.C.
Suite 322, 604 Columbia St.,
New Westminster, B. C.

Region Eight
(D. C., N. C., S. C., Va., W. Va.)
Norfolk, Va., June 10-15, 1959
Aboard M. V. Arosa Sun
Dr. Irwin T. Domsky
2780 S. Randolph St., Arlington, Va.

Region Nine
(Florida)
Gainsville, Florida, May, 1959
Dr. Joy E. Adams
401 Florida Natl. Bank Bldg.,
St. Petersburg, Fla.

Region Ten
(Ala., Ga., Ken., Miss., Tenn.)
Louisville, Ky., Oct. 9-11, 1959
Brown Hotel
Dr. Chester A. Nava
4140 Shelbyville Rd., Louisville, Ky.

Region Eleven
(Ark., La., N. Mex., Okla., Texas)
Southwestern Chiropody Congress
Little Rock, Ark., June 17-20, 1959
Marion Hotel
Dr. W. C. Gigerich, Gen. Chairman
Arkansas Natl. Bank Bldg., Hot Springs, Ark.

Region Twelve
(Ariz., Cal., Nev., Utah)
Western Chiropody Congress
San Francisco, Calif., May 29-30, 1959
Mark Hopkins Hotel
Dr. Alfred G. Roos
209 Post St., #412, San Francisco 8, Calif.

Alabama Association of Chiropodists
Mobile, Ala., April 5, 1959
Admiral Seems Hotel

Georgia Podiatry Association
Atlanta, Ga., April 11-12, 1959
Henry Grady Hotel

West Virginia State Convention
Charleston, West Va., May 15-17, 1959
Daniel Boone Hotel

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NATIONAL
House of Delegates, August 27, 28, 31, 1959
SCIENTIFIC SESSIONS, AUGUST 29, 30, 31, SEPTEMBER 1, 1959
WALDORF-ASTORIA HOTEL, NEW YORK, N. Y.

REGION 3. ANNIVERSARY CONVENTION

10th Anniversary Region 3, Chiropody Science Conclave

Delaware, Maryland, New Jersey and Pennsylvania

50th Anniversary Chiropody Society of Pennsylvania

Thursday, Friday, Saturday, Sunday — May 7, 8, 9 and 10

AMBASSADOR HOTEL — ATLANTIC CITY, N. J.

SCIENTIFIC PROGRAM

American Society of Chiropodical Roentgenology—
"Practical Use of X-Ray in Clinical Diagnoses and Treatment"
Demonstration of the many methods of proper use of X-Ray for diagnostic and treatment procedures especially concerning legal and compensation cases.
Pitfalls encountered and proper remedies.

American College of Foot Surgeons (Eastern Division)—"Symposium on Tumors of the Feet."—Procedures for treatment of soft tissue tumors: neuroma, lipoma, melanoma; bone tumors: osteochandroma, cysts, osteoma.

American College of Foot Orthopedists (Eastern Division) — "Geriatric Foot Care."
Presented by Fellows of the A.C.F.O.—
A. Marvin J. Rubin, D.S.C., Hasbrouck Heights, N. J.—"Pathomechanical Disorders with Tested Methods for Weight Distribution";
B. Herman L. Siegler, Pod.D., Levittown, L. I., N. Y.—"Clinical Management of Geriatric Dermatoses";
C. Joseph R. Cinzio, D.S.C., Passaic, N. J.—"Pain—Its Manifestations, Evaluation, Laboratory Analyses and Clinical Management."

ROBERT K. STINAFF, D.D.S., Akron, Ohio—President, Academy of Dental Practice Administration.
"ETHICAL EXPANSION OF INCOME"
An intensive one-day course in Chiropodical Practice Management. How to keep your income apace with current inflationary trends. Presented by a nationally recognized lecturer and counselor on professional practice administration.

RICHARD T. SMITH, M.D., West Point, Pa.—"ARTHRITIS"—Differential diagnostic features of the arthritides. Technique and rationale for successful local treatment.

MORTON WITTENBERG, D.S.C., Augusta, Ga.
"OFFICE EMERGENCIES"—Recognition and emergency measures to combat untoward reactions in office practice.

EVALUATION FORUM:
A. Appraisal of Temaril—Milton E. Ashur, D.S.C., Jersey City, N. J.
B. Clinical Application of Onycho-Phytex—Thomas J. Fletcher, D.S.C., Cleveland, O.
C. Use of Hydeltrasol in Combination with Ultrasonic Therapy—Louis P. Zulli, D.S.C., Phila., Pa.

SAMUEL ABRAMS, Cleveland, Ohio—**"97 WAYS TO OPEN YOUR OFFICE DOOR"**

SAMUEL R. MICHAEL, B.S., D.D.S., Cleveland, Ohio—"Complications in Anaesthetic Reactions"—Problems in anaesthesia and helpful hints in technique improvement.

"THE DERMATOLOGIST VIEWS THE VERRUCA"—
A. Herman Kline, M.D., Atlantic City, N. J.—"Evaluation of Tincture of Thuja."
B. Jacob Bleiberg, M.D., Newark, N. J.—"Witchcraft, Warts and Wisdom."
C. Open Forum.

CHARLES S. GREINER, D.S.C., Columbus, Ohio—"How Young Is Your Practice." Practice building potential of youthful patients.

MORTON M. POLOKOFF, D.S.C., Paterson, N. J.—ORTHODIGITAL WORKSHOP.
An audience participation feature in the fabrication of toe appliances.
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JOSEPH EDELMAN, New York, N. Y.—President National Federation of Hypnotists.
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For complete program book write to Dr. Lee Lindenberg, 601 Columbia Ave., Lansdale, Pa.

JONAS C. MORRIS, D.S.C., Audubon, N. J.—"The Immediate Past National President Views the Future."

Registration: $10.00. Mail check or money order to ***Dr. Arthur M. Schultz,*** Region 3 Treas., 5046 Jenkins Arcade, Pittsburgh 22, Pa.

THE WILLIAM J. STICKEL AWARDS FOR RESEARCH IN CHIROPODY (PODIATRY)

Sponsored by the Journal of the American Podiatry Association and The NAC Agency, Inc.

RULES AND PERTINENT INFORMATION

1. Awards will be offered for papers on Research in the field of Podiatry (Chiropody).
2. Awards provided are as follows:

First Award	— $400.00	Third Award	— $100.00
Second Award	— 200.00	Fourth Award	— 50.00

Fifth Award—$50.00

3. Manuscripts will be judged by a Committee appointed by the President. The Committee is authorized to withhold the granting of Awards in the event any or all papers submitted are considered to be of insufficient merit.
4. Recipients of the Awards will be announced at the Annual Meeting of the Association. An author may be requested to present his paper at the Annual Meeting.
5. All papers received become the property of the American Podiatry Association and shall be available for reproduction in any publication sponsored by the Association. Papers must be original and all rights with regard to publication are assigned to the American Podiatry Association. The originals of all submitted papers and manuscripts will be placed in The William J. Stickel Memorial Library and Museum.
6. Papers entered must be in the hands of the Secretary by May 1, 1959.
7. Manuscripts should be typewritten and double-spaced. No limits or restrictions are imposed on the number of words, use of photographs, charts, etc. Photographs, diagrams, drawings, statistical charts, etc. will be of value in presenting the subject of your choice. Each photograph, diagram, drawing or chart shall be mounted on a separate sheet of paper and properly identified. Legends for all illustrative material shall be listed on a separate sheet. Bibliographical references shall be annotated properly in the body of the paper.
8. Manuscripts should have no personal references in the body of the paper and the name of the author should appear only on a cover sheet. This is to enable the judges to review the papers anonymously. Each paper will be assigned a number for judging purposes.
9. All inquiries concerning the Awards should be addressed to the Secretary. Members desiring to submit papers must make application on a form provided for that purpose, which may be obtained from the Secretary.
10. Authors may be required to submit a synopsis, abstract or report of their presentation. This will be for publication in the Journal, or for reading at the Annual Meeting, should it be desirable but impracticable to publish or read the original.

(Contributions from The NAC Agency and from the Journal of the American Podiatry Association provide the Awards for this research.)

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Seth Rudnick
Age 8
4th Grade, Union School
West Haven, Conn.

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H. C. Diefenbach

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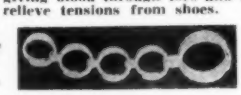

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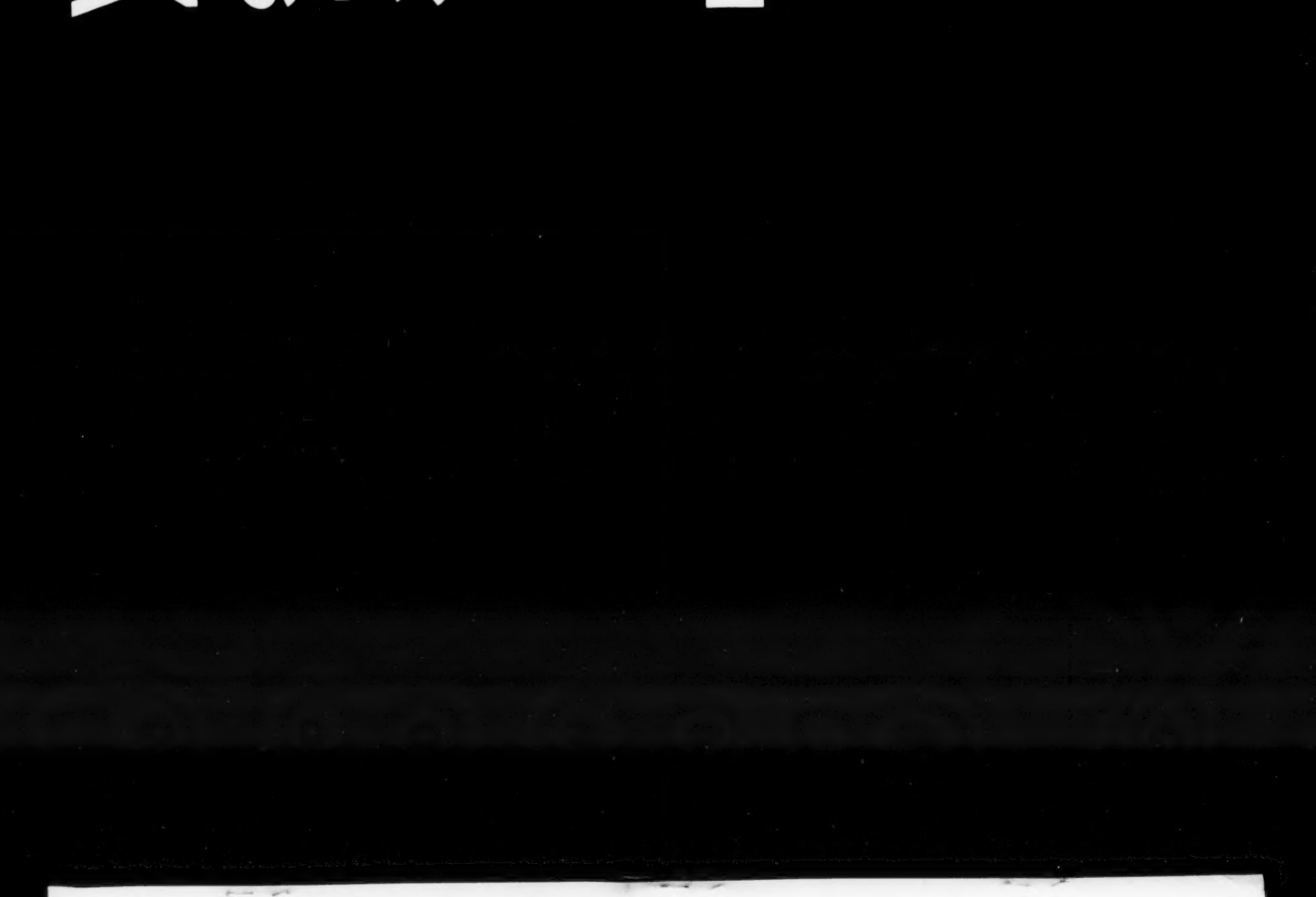
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